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THIS WEEK'S NEWS

"THE COMPETITION organised by 'The Builder' for low-cost housing is a challenge to the profession, and I hope that it will attract a large entry. I shall be most interested to see the results." So writes Mr. Bevan, Minister of Health, in "Outlook for 1951." *p.* 33

A COMPETITION for a Festival Hall is announced by Wirral U.D.C. Premiums of £500, £350 *and* £250 *are offered. Mr. P. G. Fairhurst is assessor. p.* 42

THE NEXT R.I.B.A. Exhibition, "The Architecture of Transport," will open at 66, *Portland-place on February* 22. *p.* 72

MR. ANTHONY M. CHITTY is to visit Jugoslavia shortly as the guest of the Institute of Jugoslav Science and Culture. p. 72

THE JURY'S AWARDS in the R.I.B.A. Prizes and Studentships were announced on Tuesday night. p. 75

PROPOSALS for higher efficiency in the building industry are made by the Minister of Works' National Consultative Council which has been considering the two Building Reports. p. 76

FINAL CONCLUSIONS drawn from a survey of the use of incentives of some 160 *local authority housing sites show that productivity is increased appreciably. p.* 76

BUILDING IN 1951

IN offering our readers the season's greetings and good wishes in this the 109th New Year Number of *The Builder*, we cannot do better than call their attention to the Messages from His Majesty's Ministers and from the leaders of the industry in its various branches on the outlook for the forthcoming year, which may well prove one of the most momentous in our history. To a heavy programme of building imposed by the social and economic needs of the nation—housing, factories, schools, hospitals and so forth—now has to be added an increasing volume of work due to the demands of rearmament which, through no fault or desire of our own, is abruptly forced upon us. No one can have any doubt of the formidable nature of the task confronting the industry. What are the prospects of its accomplishment?

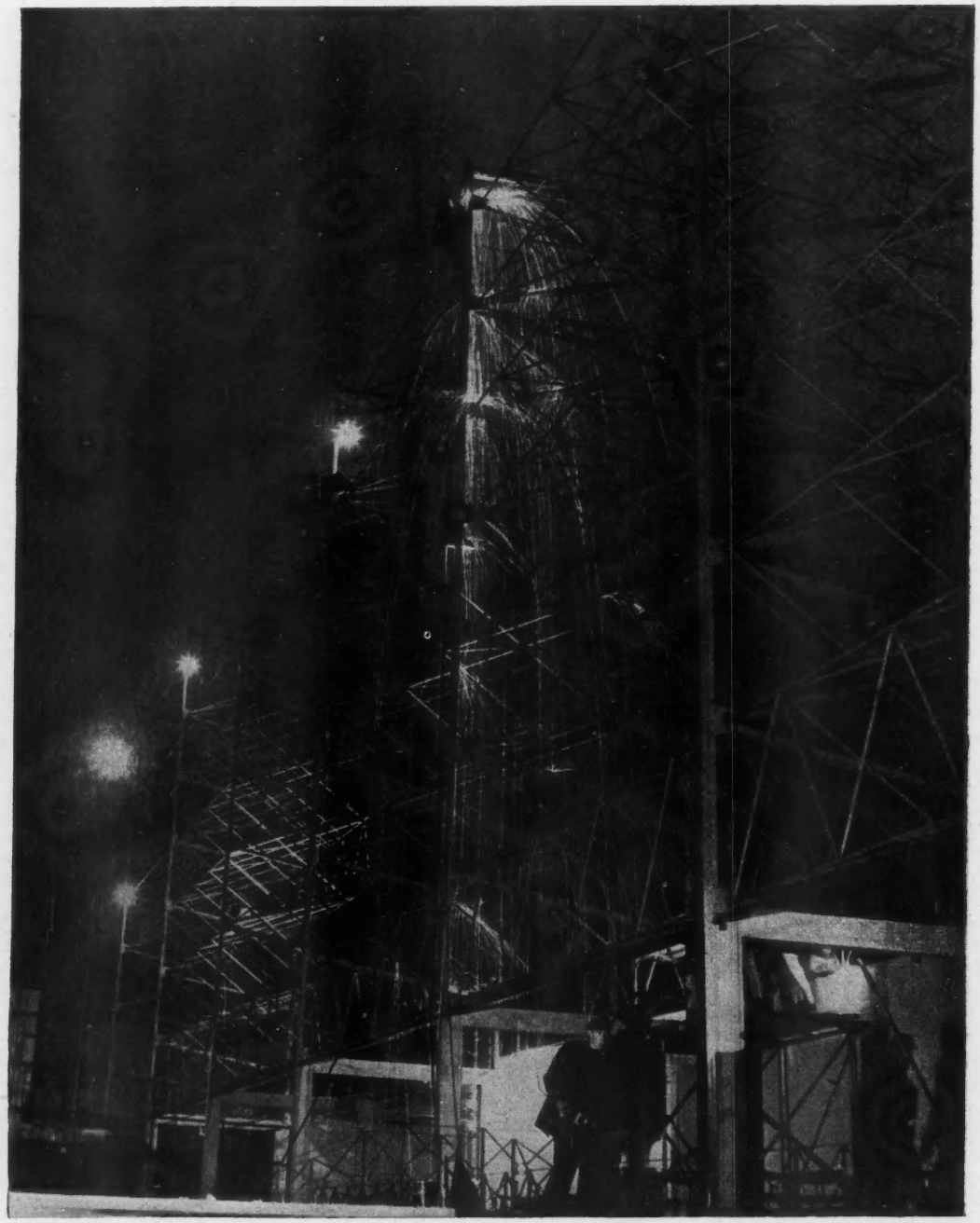
The obvious need is still for greater production at lower cost. The recent Reports of the Building Industry Working Party and of the Productivity Mission to America should by this time have been digested by those whose task it is to put their recommendations into effect. We should not expect miracles at once, but steady improvement should occur with the passage of time. One of the most hopeful factors in the situation is the recent settlement on the question of incentives between the National Federations of Building Employers and of Operatives. True, the decision to operate a bonus scheme is still the responsibility of the individual employer and its actual operation a matter to be settled between the employer and the men on the site, but incentives are no longer a doubtful experiment; they have proved their value in increasing output and lowering cost, and all that is necessary on the human side is the good will to make them a complete success. The one doubtful element is an abundant supply of materials, without which any incentive scheme is reduced to negation and absurdity. On this point it is encouraging to have the assurance of the Minister of Works that there will be more cement and more bricks in the home market in 1951 and that the Government is doing all it can to get a working reserve of materials.

The strength of the building industry, like that of a chain, is in its weakest link. Are there any weaknesses on the professional side? The complaint is often heard from quantity surveyors and builders that architects fail to produce drawings either adequately or in time. Occasionally this may be so, but how often are the architects culpably at fault? More often than not delays are due to clients, both public and private, not making up their minds promptly enough or changing them when drawings are already in hand. Clients must be brought to realise that indecision or vacillation on their part is not only a source of irritation and delay to others but costly to themselves. There must, however, be no attempt to hide behind this screen. Architects and builders, as well as clients, must do their full part.

Economy in design may well play an important part in the success of the building effort during the year ahead. The available supply of building materials must be made to go much further and without any harmful lowering of standards either of construction or amenity. Here is a task of first-rate importance for the architectural profession. The Minister of Health in his message to *The Builder* gives an excellent lead by announcing the putting into effect by a considerable number of local

authorities, on his personal encouragement, of an economy often advocated in our columns, namely, a reduction in the height of rooms to 7 ft. 6 in. without detriment to health or comfort. It is our hope that *The Builder* low-cost housing competition may be productive of many other ideas for real economy in both design and construction.

A threatening international situation diverts, temporarily we must hope, the building industry in part from its main task of promoting social welfare and happiness. In a mood of pessimism towards the end of his life H. G. Wells declared that *homo sapiens* had failed and was doomed to extinction. The gloomy prophecy can be falsified by co-operation among the nations of the free world. In this work the building industry of our country has a part to play second to none. Co-operation, as cordial as energetic, among all branches of the industry will be a vital necessity if it is to do all that is expected of it during the coming year. We have no doubt that it will be forthcoming.



SOUTH BANK NOCTURNE. This striking night view is of the decorative screen to York-road, illuminated by the rain of molten particles as the welder, poised against the skyline, carries on his work. The first of a series of articles on the use of structural materials in the exhibition begins in this issue

OUTLOOK FOR 1951

MESSAGE FROM THE RIGHT HONOURABLE ANEURIN BEVAN, M.P., MINISTER OF HEALTH

THE eve of a New Year affords me once again a welcome opportunity of sending a message to readers of *The Builder*.

The provision of new homes has proceeded steadily during the past year, and the total produced since the war is now well over 1¼ million, including over 800,000 permanent houses and flats. Although the demands on the industry will increase as work under the rearmament programme grows in volume, the Government intends to build as many houses as possible within the money limits of the capital investment programme and with the available supplies of material. Greater productivity is, therefore, more necessary than ever, and I know the nation can rely upon all those engaged in the industry, both in the manufacture of materials and their assembly, to co-operate fully in measures to achieve it.

The need to reduce the costs of houses is also pressing, and while some reduction should result from higher productivity we cannot afford to neglect any other means to this end. I welcome the new agreement by both sides of the industry on incentive schemes. I welcome also any measures to promote the development of new thought and new ideas for securing improvements and lower costs without loss of amenity. I have personally encouraged local authorities to adopt lower heights for rooms than many bye-laws require, and I am gratified to find that a considerable number of urban and rural authorities are building houses with rooms 7 ft. 6 in. high with no detriment to the health and comfort of the occupants. There may well be other ways of saving money, labour and materials without lowering our present-day housing standards. The competition organised by *The Builder* for low-cost housing is a challenge to the profession, and I hope that it will attract a large entry. I shall be most interested to see the results.

A happy and fruitful New Year to you all !

ANEURIN BEVAN

FROM THE RIGHT HONOURABLE RICHARD STOKES, M.C., M.P., MINISTER OF WORKS

IT is a great pleasure to me to send New Year greetings to readers of *The Builder*.

There will be a larger volume of work to be undertaken by the industry in 1951 than last year. This additional demand on the industry's resources will call for more materials and an increase in productivity. There will be more cement and more bricks in the home market in 1951, and the Government is doing all it can to get a working reserve of materials.

As regards productivity, I am hoping for greater production with reduced costs and no lowering of that high quality which is the accepted tradition of the building industry. 1950 saw important developments for building productivity. First came the publication of the reports of the Building Industry Working Party and of the Productivity Mission to America. These two reports have provided a number of stimulating ideas, and I have been working out with the professions and both sides of the industry ways and means of giving effect to their recommendations. I hope that in 1951 these discussions will bear fruit in practical results. Then there was the fresh agreement on incentives announced just before Christmas, which I regard as an important step forward towards the goal of higher productivity. I am setting great store on the wide adoption of incentives, for I am convinced that good payment-by-results schemes properly applied with the co-operation of employers and operatives can make an important contribution towards that increase in productivity which will at once increase the speed and lower the cost of building. I also attach great importance to joint consultation on site so that every man may understand what is expected of him, have a chance of having his say, and so give of his best.

THE MINISTER OF HEALTH (Mr. Aneurin Bevan, M.P.), who contributes a New Year Message to our readers, is seen above presenting a M.O.H. Housing Medal to Mr. T. R. Bateman, A.R.I.B.A., at the R.I.B.A. in September last.

The houses, schools, factories and all the other buildings that make up the 1951 programme are closely bound up with the workaday life and economic well-being of the country, and I have every confidence that in 1951 the building industry will translate into practice the developments of 1950 and play its full part in making the year one of solid achievement.

Good luck to you all, and my best wishes for the New Year.

R. R. STOKES

FROM THE RIGHT HONOURABLE HUGH DALTON, M.P., MINISTER OF TOWN AND COUNTRY PLANNING

IN 1851 a miracle of speedy construction, by the standard of the times, occurred when the Crystal Palace was built in Hyde Park. People from all over the world came to wonder at this great achievement.

In 1951 great achievements are also required of the building industry—fast building, good building and building at reasonable cost.

I hope that in 1951 the building industry with its great tradition will once again meet the challenge of the times.

HUGH DALTON

FROM MR. ARTHUR BOTTOMLEY, M.P., SECRETARY FOR OVERSEAS TRADE

BEST wishes for the New Year to all readers of *The Builder*. The building materials industry has had a good year for exports, and I must particularly commend this journal for its initiative in making a first-hand investigation of the Canadian market in a special Canadian issue.

As the impact of rearmament cuts into the British economy, we shall inevitably have difficulty in sustaining exports of the engineering and other industries directly affected by armament orders. A greater share of the task of keeping up a sufficient flow of exports to allow our country to continue to pay its way—and in particular of exports to North America—must then inevitably be borne by the other exporting industries.

This is work in which the building materials industry will, I am confident, play a worthy part. It calls for boldness in developing stocks and services in new territories, and for hard and painstaking effort to get the product known to architects, surveyors, contractors, and builders. These demands have not deterred you in the past, and I know that they will not deter you in the future.

I wish you all good fortune in meeting the challenge of this New Year.

ARTHUR G. BOTTOMLEY

*** *Messages are continued on page* 73

MATERIALS in the SOUTH BANK EXHIBITION

1.—The Use of Steel

By JOHN RATCLIFF, A.R.I.B.A., A.M.T.P.I.

VISUALLY EXCITING as the Festival of Britain Exhibition on the South Bank promises to be, there is an equal value in the treatment and use of materials in the construction of the various buildings. Considerable ingenuity has been displayed in the adaptation of established techniques to special uses, and these, in some cases, have an interest not less great than that of the structures themselves. We have asked Mr. John Ratcliff, A.R.I.B.A., A.M.T.P.I., to survey the exhibition from this angle, and the first of his articles, on Steelwork, appears below. Others will follow monthly.—EDITOR

IT would be premature at the present time to attempt any comprehensive account of the buildings in the South Bank Exhibition. For whilst the carcases of the buildings are largely complete and about to receive the interior display installation, and whilst the general exterior appearance can be assessed, there is still much to be done, and it would be imprudent to count the proverbial chickens! Nevertheless, there are some matters which may be usefully recorded before the floodgates of full publicity open, when everyone will have had their fill and there will be no room left for detail.

In these articles it is proposed to deal briefly with the ways in which certain materials, largely structural, have been used in the exhibition—materials such as steel, concrete, timber, glass, canvas, etc. For the reasons already given, attention will be focused on details and broad similarities of use rather than on complete buildings. In a later article it is proposed to give a brief description of the organisation behind the construction of the buildings and site works.

Some Structural Problems

In an exhibition of this nature, there are many factors which have to be considered in the design and construction of pavilions and administrative buildings, apart from functional requirements and æsthetics. Some might think, without reflection, that as the structures on this site are exempt by statute from the provisions of the London Building Act and associated bye-laws, a "whale of a time" could be had by all! Alas, this has by no means been the case, for the Festival of Britain Office must take a no less responsible attitude towards the safety and well-being of the public than the normal statutory authority, and whilst undoubtedly in some instances things have been done which are justified by the special circumstances, the requirements laid down on questions of public safety, fire prevention, structural stability, ventilation, etc., have, if anything, been more stringent than normal. In addition to these questions of public safety, however, there is the ever-present factor of time. The exhibition is due to open on May 4 and remain open five months. In order to achieve this opening date, it was required that the pavilions to house the exhibition displays—which are after all the most important parts of an exhibition—should be ready for the installation of display construction by the end of November, 1950. In order to phase construction to make use of labour efficiently and economically, it is clear that many buildings have had to be completed substantially earlier than this date, and in fact the greater part will have stood twelve months by the time the exhibition closes and demolition begins. During this time they will have withstood a winter with possible heavy snow loads and the usual rigours of the British climate, and a summer which we hope will be equal to the event. This, then, is no village fête or agricultural show, here to-day and gone to-morrow, erected with a blithe disregard of all the irksome facts of weather.

Temporary Construction is Uneconomic

It has been found, therefore, that the much-vaunted advantages of temporary structures, using such materials as building boards, canvas and timber, are largely mythical in these circumstances, and that it is probably cheaper and quicker in the long run to use "permanent" construction. Even prefabrication produces more problems than it solves in the time available. Surprising as it may seem, therefore, the solution to these building problems has been largely met by traditional methods, that is, normal steel construction, a certain amount of normal reinforced concrete, normal brick and stone loadbearing or panel walls, oversite concrete floors, etc. There are, of course, the exceptions, but whilst there will be many exciting æsthetic features, the structures and constructional features are not dramatically out

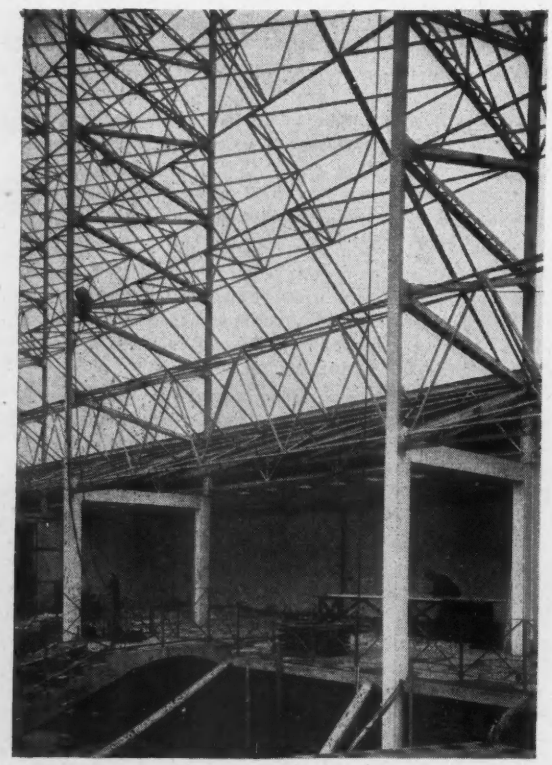


Fig. 1.—Decorative screen to York-road: detail of typical steelwork bay

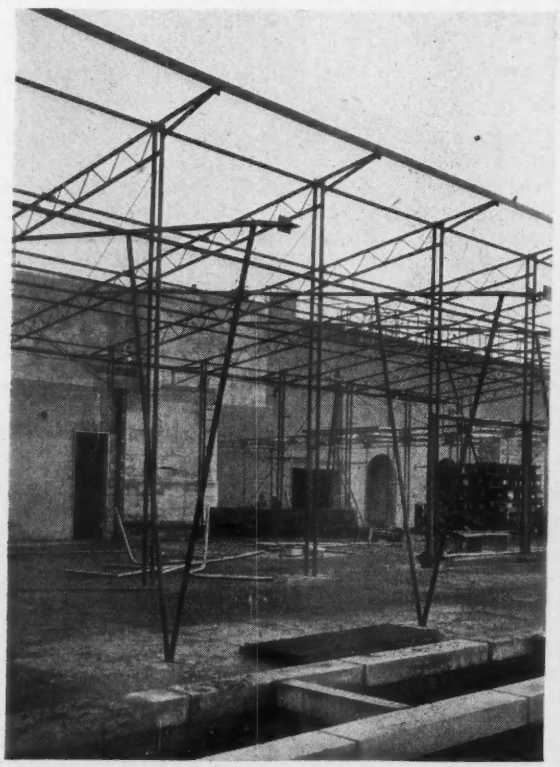


Fig. 2.—Harbour Buffet: detail of typical steelwork bay

of the ordinary. The more complicated and special a part of a structure may be, the longer it will take to deliver on site, and the more costly within the tight limits of the architects' budget it will be. The aim has therefore been simplicity and normality. From an engineering aspect, each problem has been one of meeting the practical and æsthetic requirements of the architect, and treating it on its merits in the light of the delivery time of materials and of similar factors appertaining at the time.

Steel is the structural material in by far the greater proportion of buildings, as befits a country which makes steel and has a long tradition in the use of it. The structural advantages of steel need no description here, but from the point of view of the time factor, it is possible, under favourable circumstances, to proceed with a good deal of building work on site, such as foundations, floor slabs, etc., whilst the steel is being fabricated. Once the steel is delivered, and assuming there are no significant late deliveries to retard progress, erection is rapid, especially when used with sheet cladding materials. There are, however, certain disadvantages: for instance, the time schedule may not permit of waiting even for the time for fabrication, and in one case, to be described later, reinforced concrete had to be adopted to allow work to proceed immediately. Furthermore, although much of the steelwork is of normal design employing normal sections, several delays have occurred due to waiting for deliveries from the rolling mills. More latterly, much effort has been spent in searching for normal sections, and modifications have had to be arranged where conditions have permitted. In the main, however, the exhibition has been fortunate in acquiring steel at a time when it was reasonably plentiful, after the controls were lifted, and before the first blast of defence needs arrived. Not all the steelwork, however, is of straightforward design, and in some complicated cases it has been a question of finding sufficient firms to tender who could ensure fabrication and delivery in the required time.

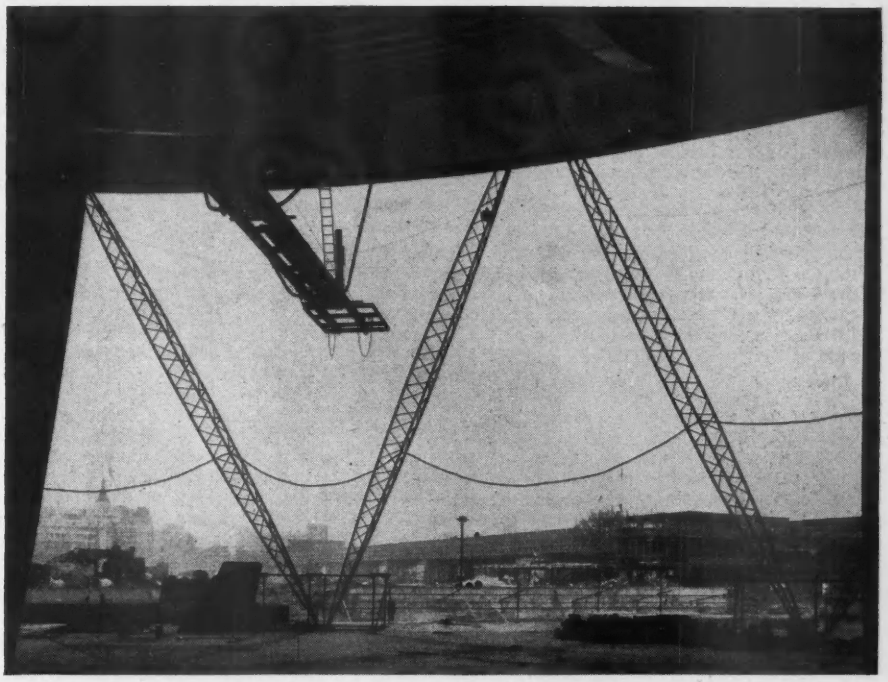


Fig. 3.—Dome of Discovery: view of tubular steel struts, taken from under eaves of dome

Importance of the Time Factor

An example of the time factor in operation is provided by the building which will house the British Broadcasting Corporation's equipment and the main telephone exchange. This, for various siting reasons, forms part of the Royal Festival Hall terrace facing the river. Thus it will be seen that, on the one hand, the start of construction was limited by progress on the larger permanent structure, in particular the exterior, and on the other by the required early date for completion, so as to enable the complicated wiring and equipment to be installed in time for the opening day. In these circumstances, reinforced concrete frame construction would have been too slow, and it was decided to employ a steel frame using standard sections readily procurable. Although planning of the building had proceeded sufficiently to show the general extent and shape of the structure, the steelwork design was finished before the final detailed planning, thus enabling a rapid programme of erection to be fulfilled.

Another incidental, though important, advantage in the use of steel in exhibition building must be mentioned. This is its salvage value, for, as already mentioned, all the buildings on the site, except of course the Royal Festival Hall, are due to be demolished after the close of the exhibition, to make way for the permanent redevelopment of the South Bank. As it has been possible to dispense with the need to encase steelwork in concrete, demolition of steelwork should be relatively easy, and a high salvage value should result.

Varying Uses of Steel

It is interesting to note the different ways in which steel has been used in the structures of the buildings. In order to promote a high standard and variety of design, it has been the policy of the Festival Office to commission a different architect to design each building and, rather than impose upon him some preconceived standard form of construction, to hand him the practical requirements and the financial budget, and allow him to produce the best solution within the fewest possible limitations.

In some cases the architect has decided deliberately to economise on the structure in order to be in a position to spend a greater proportion of money on materials and standard of finish. A particular case is the Homes and Gardens pavilion, where the architect decided to use stone and brick walls and a flat roof supported by "warren" girders in tubular scaffolding, using normal connectors, except in the case of the truss principals. This will be concealed by false ceilings, as it would have been inappropriate to expose the structure in a pavilion dealing with this domestic subject. Although the depth of the trusses is 7 ft. over a maximum span of 41 ft. this is no disadvantage as the ceilings can be relatively low. Furthermore, the maze of electric conduits, public address, broadcasting and management communication services can easily be accommodated in the roof space, with adequate access along catwalks. A further economy has been achieved by hiring the tubular scaffolding for the duration of the exhibition (plus the construction and demolition time), which has proved to be cheaper than outright purchase.

In some cases steel has been employed in a normal framework of standard sections. Instances of this are the Regatta Restaurant, which is next to the Hungerford railway viaduct and the river wall, and the Staff Accommodation building adjacent to Waterloo-road. In the former case, spans of the order of 16 and 22 ft. have been used, with stanchions, bolted together on site, and floors formed of precast concrete units and roof of woodwool slabs, covered with a screed and roofing felt. As the site conditions of the Staff Accommodation building have produced a tall narrow building, it has been possible to use steel economically with spans of about 18 ft., subdivided into three bays in conjunction with *in situ* concrete floors, 3 in. thick, and woodwool slab roof.

"Expressionist" Steelwork

In some of the exhibition pavilions, the architect has decided to use a type of steel structure which is expressive of the subject of the particular exhibition story. A good instance of this is the "Sea and Ships" pavilion, sited appropriately adjoining the river. This can hardly be described as a "pavilion" in the normal sense; it is an open structure, designed to accommodate the various large-scale exhibits, and consists of a series of smaller pavilions, screens and canopies, the whole being tied together visually by a lattice steel framework reminiscent of the gantries in a shipbuilding yard. This framework is composed of 3 in. × 3 in. angles with diagonal bracings of 2 in. × 2 in. angles. Another example is the "Country" pavilion, in which will be told the story of agriculture and rural pursuits: this will be housed appropriately in a Dutch barn type of structure, having light steel

trusses forming a curved roof and supported on stanchions.

Lastly, there are the instances where the architect, in collaboration with the engineer, has exploited the qualities of the steel structure to enhance his æsthetic intention. Examples of this, which will be described presently, are the welded tubular structures of the decorative canvas screen alongside York-road, and the interior views of the "Power and Production" pavilion, where the intricate welded tubular frames will form a fitting background to the industrial displays.

There are, of course, many intermediate categories of structural treatment in steel, and it will be convenient if we deal first with the use of steel tube.

Some Examples

Fig. 1 shows a close-up of a typical bay of the decorative screen alongside York-road. The object of this screen is to obscure the view of Waterloo Station seen from the exhibition, the height being 60 feet and the length 330 feet. The tubular framework will be filled with a series of pyramidal shapes in coloured canvas, providing a semi-closed pattern in three dimensions. Not only has the structure been designed to take care of the stresses set up by wind on these canvas shapes but also the tubes have been used in a decorative manner to provide the fixings along the edges of the canvas pyramids. The complexity in setting-out and the degree of craftsmanship in making the welded joints can be appreciated from the photograph. A closer inspection will also reveal that the bracings of the main vertical principals are in welded lattice construction.

Fig. 2 shows a typical part of the framework over the public portion of the Harbour Buffet restaurant, near the Shot Tower. This framework will support a coloured canvas roof which will give a translucent effect in the interior. This is an example of the use of welded tubular scaffold construction, which has now become common practice, and the resultant lightness in effect can be noted. An indication of the economy in the use of material can be given by the fact that only certain members can be drilled to allow the insertion of electric cable, and thus make use of the structure as conduit.

The Dome of Discovery

Fig. 3 shows the use of steel tube for a more serious structural purpose, for these are the struts which are responsible for carrying the great aluminium Dome of Discovery, of 365 ft. diameter. The ends of each strut terminate in steel pins of 2¼ in. diameter, each of which takes a designed stress of 28 tons. These hinged triangulated struts are the means of taking up the movements in the dome due to wind and the effects of heat. The view is taken looking outwards towards the eaves of the dome. The galleries are carried on separate supports, and it is a pity that the purpose of this building as an exhibition pavilion does not allow the dome to be seen resting only on these filigree-like struts.

Perhaps the most exciting use of steel tube from an æsthetic point of view is in the structure of the "Power and Production" pavilion. Here will be displayed various aspects of British industry, and the structure has been designed as a refined industrial shed, which will form a fitting background to machines in action and other displays. Figs. 4 and 5 are not intended to do justice to the main conception of this building, which is outside the scope of this present article, but they give some idea of the lightness and playfulness of the structure. Fig. 4 shows a novel "space-frame" type of purlin, supporting asbestos sheeting and carried on tubular steel warren girders. An interesting detail is the steel wire cable supporting the edge beam of the gallery floor at intervals from the main roof system. Fig. 5 shows a close-up of another section of the roof structure, which demonstrates the variety in the design of the structural shapes. It will be seen how the members are made up as a series of units which have been bolted together on site. Particularly noteworthy are the welded joints of the tubes, which have been designed so that each tube meets its parent member separately, so avoiding cutting in more than one direction. Also to be noted is the use of tubes of different diameters together with steel bar for some tension members.

There are, of course, many other examples of the use of steel tube, and it is only possible to draw attention to the more obvious ones here. In the next article, mention will be made of steel structures employing normal rolled sections, before dealing with the use of other materials in the Exhibition.

(To be continued)

Sculptor Awarded Gold Medal

THE MEDAL of the Royal Society of British Sculptors for the best work of the year by a British sculptor, in any way exhibited to the public in London, has been awarded in gold to Mr. Wm. McMillan, R.A., for his fountain group in bronze erected under the auspices of the Constance Fund in the Spring of 1950 in the Queen Mary Garden, Regent's Park.

The Medal was founded in 1925 by Sir Otto Beit, Bart, K.C.M.G., F.R.S.

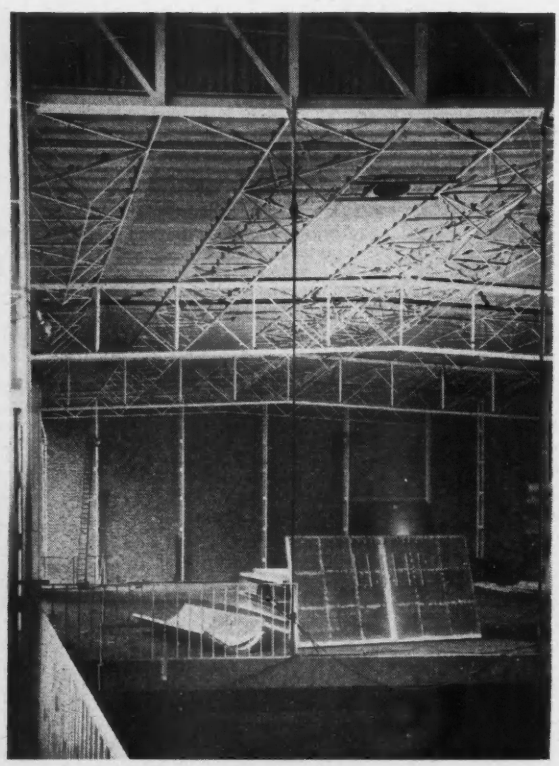


Fig. 4.—Power and Production pavilion: first-floor gallery at east end

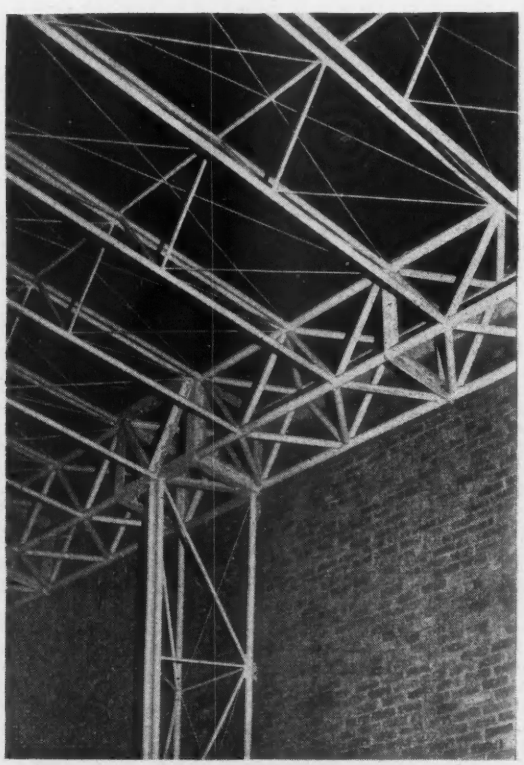


Fig. 5.—Power and Production pavilion: detail of roof at west end

WREN'S CASTLES IN THE AIR

His Unrealised Schemes for Royal Palaces

By MARTIN S. BRIGGS, F.R.I.B.A.

THE story of Wren's disappointment when his magnificent Greek Cross design for St. Paul's was rejected is well known, and even if he did not actually shed tears on that occasion, as an unsupported tradition relates, he was bitterly mortified. He was not given to bursts of passion or emotion, but it was a blow to his artistic ambition. Nevertheless, this "Rejected Design" was only one of many such unrealised projects, and it is with some of those less familiar schemes that the following article and the accompanying drawings are concerned. The four examples described are all unrealised designs for royal palaces, literally "castles in the air," or more precisely castles on paper, for they are all preserved for us in fine drawings contained in various collections.

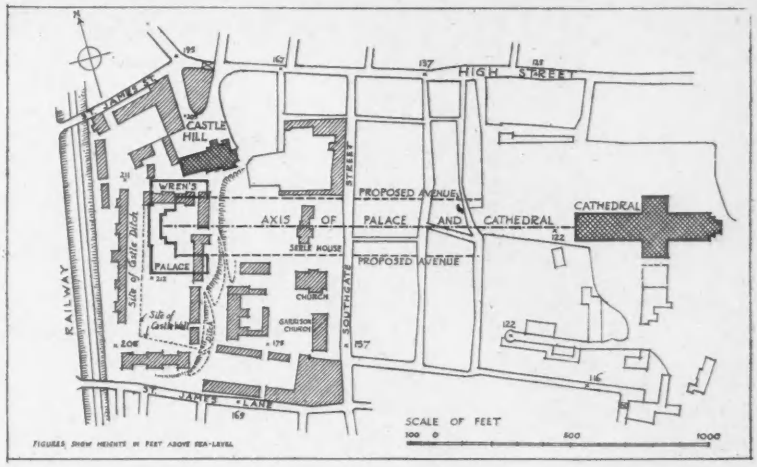


Fig. 1.—Plan showing position of Wren's Palace at Winchester and its relation to existing buildings (hatched) including the Great Hall of the Castle (cross-hatched)

My plans here reproduced have been compiled from Wren's actual drawings, but they also show present-day landmarks and streets so that the reader may be able to visualise for himself the proposed extent and nature of Wren's tremendous schemes. He had little sympathy with Gothic and Tudor buildings, which he regarded in general as somewhat uncivilised and also lacking in structural science. The drastic demolition of such buildings which he contemplated is therefore comprehensible, given his point of view, though the extent of it is perhaps hardly realised. On the other hand, he did propose to retain the Great Hall at Hampton Court as the central feature of his vast new palace, and when planning the new Whitehall round Inigo Jones's Banqueting House he also related it to Westminster Hall and to the Abbey, though everything else was to be swept away.

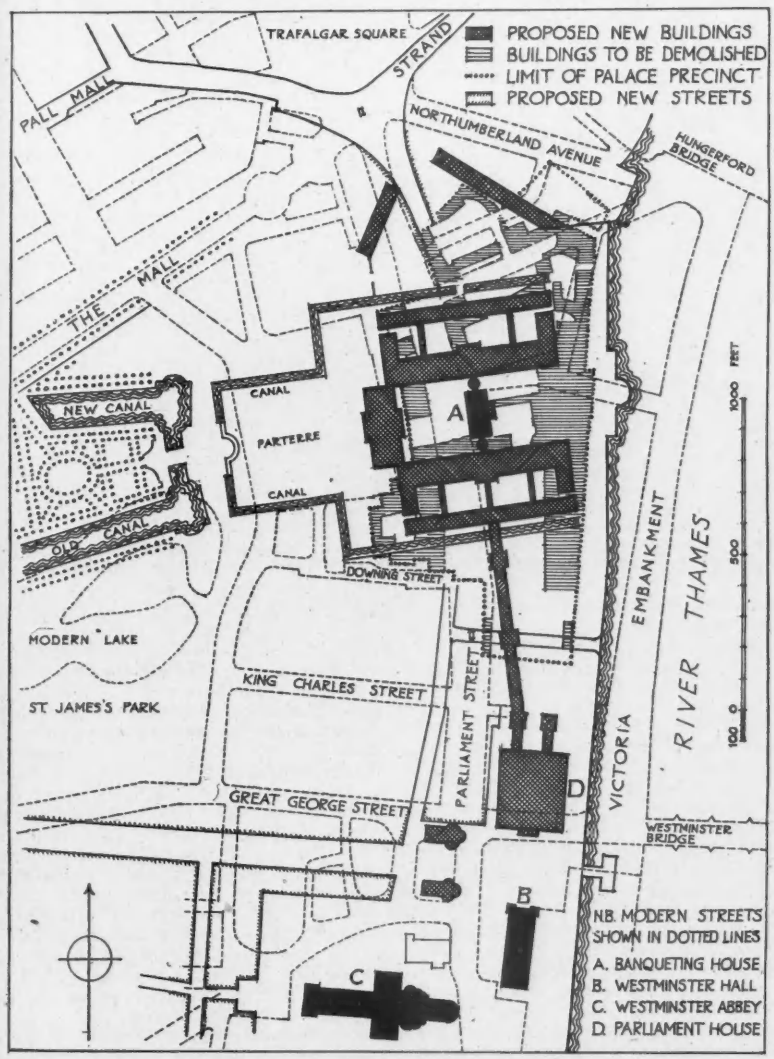


Fig. 2.—Wren's third design for rebuilding Whitehall Palace, 1698

Wren was not entirely an iconoclast, as his work at Westminster Abbey proved; in repairing the spires of Salisbury and Chichester cathedrals he concentrated all his great skill and ingenuity on preserving mediæval masterpieces; but in these four palace designs he was ruthless. They stand, however, as evidence of his ability to plan on the grand scale. Proof of that ability is furnished by his two fine royal hospitals at Chelsea and Greenwich, where in spite of all the work done by later architects the splendid layouts are Wren's own and still remain to be seen. The four palaces now to be described are in different case, for not one of them now remains as Wren intended. He must have been inspired by his single visit to France in 1665, where he saw several great *châteaux* and met the famous Bernini from Rome, but he also possessed and studied many folios of Italian and French designs in the Baroque manner. England and France in the late seventeenth century were in close contact, as well as in rivalry, and the splendours of Versailles must have been frequently at the back of the mind of Wren as well as of his royal clients when he was devising one extravagant scheme after another to gratify their princely tastes.

Newmarket and Winchester

The series really begins with the King's House at Newmarket for Charles II, not illustrated here, about which little seems to be known save that it was destroyed by fire in 1683 and may have been designed by

Wren. The King had then already instructed him to prepare plans for a new palace at Winchester, probably in 1682, and Evelyn states in his *Diary* for September 23, 1683, that the foundations were already being dug at the time of the fire at Newmarket which "made the King more earnest to render Winchester the seate of his autumnal field diversions for the future, designing a palace there, where the antient castle stood; infinitely indeede preferable to New-market for prospects, air, pleasure, and provisions." Charles was then 53 years of age and apparently looked forward to many more years of joyous living in this and his other palaces, but he died suddenly in 1685 when the roof of the new building was just completed.

The ruins of the old castle, except the Great Hall, which still survives (see Fig. 1), were cleared away, and the new palace, with a frontage of over 320 ft., was planned somewhat on the lines of Le Vau's Versailles, before J. H. Mansart enlarged it for Louis XIV. The site stands high, overlooking the town and the valley. Wren intended to lay out an avenue 300 ft. wide from the palace to the west front of the cathedral, with which it was axially aligned. This was to be "a regular Street of handsome Houses, leading in a direct Line down the Hill, . . . for which, and for the Parks, the Ground was procured." The spacious formal gardens were to be surrounded by a park of eight miles circumference, and that in turn by a forest of 20 miles circumference, "without either hedge or ditch." One of the two wings of the palace contained the King's apartments, the other the Queen's, and each had its chapel. Although not florid externally, the building was more palatial and less domestic in appearance than Chelsea Hospital. After Charles's death in 1685, building operations languished and soon ceased. Queen Anne had a survey made of the structure and an estimate of the cost of completing it; but nothing else seems to have been done either by her or her two successors. During the second half of the eighteenth century it served to accommodate French prisoners-of-war in large numbers; in 1796 it was converted into barracks for 2,000 soldiers; and in 1894 it was totally destroyed by fire. The new barracks, erected in 1899 and still standing, incorporate some architectural fragments of Wren's great palace, otherwise the whole vast building has disappeared. His failure to see this noble scheme completed must certainly have been one of his major disappointments.

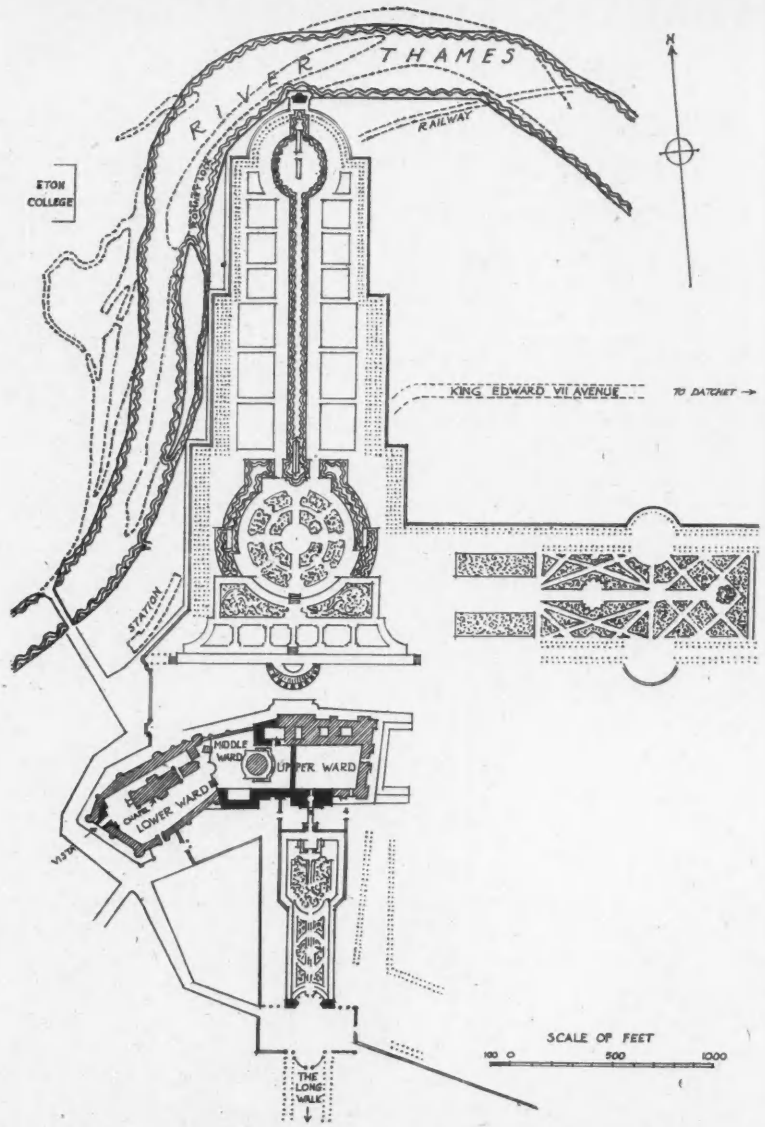


Fig. 3.—Wren's design for the gardens and partial rebuilding of Windsor Castle, 1698. Proposed new buildings shown in black, old buildings hatched, modern landmarks in dotted lines

Remodelling of Whitehall

He prepared at least two schemes for altering and remodelling Whitehall for Charles II. The old Tudor palace of Whitehall was largely the creation of Wolsey and Henry VIII. Its extent may be realised from my drawing (Fig. 2). It was a picturesque rambling rabbit-warren containing some 2,000 rooms. The water-front, as my plan shows, stood far back from the line of the modern Victoria Embankment, and some distance behind the frontage-line of Wren's projected riverside terrace. In 1619-22 Inigo Jones had erected the Banqueting House, which his pupil John Webb would have woven into an otherwise entirely new palace, for which plans have survived. Wren's first actual building in the Whitehall precinct was a new wing about 300 ft. long, running east from the Holbein Gate and south of the Banqueting House. It included a new chapel, and a new Council Chamber projected from it behind the Banqueting House. This new wing, built at enormous cost in 1685-6, was completely destroyed by fire in 1698 and is not shown on my plan.

A previous fire in 1691 had destroyed another part of the palace, and when Wren in 1698 prepared his third scheme, the superb project shown on my plan, he appears to have assumed that ample funds would be forthcoming to create a worthy rival to Versailles, then in process of aggrandisement by J. H. Mansart. This assumption is the more inexplicable because William and Mary hated Whitehall from the outset of their reign, preferring to live either at Hampton Court (see later) or at Kensington "House," which they purchased in 1689 and immediately commissioned Wren to alter. Nevertheless Wren's design was prepared regardless of expense and almost regardless of ancient monuments. For Inigo Jones's work, however, he had boundless admiration, and he made the Banqueting House the focus of his tremendous layout. Taking an axial line east and west through its centre, he projected it eastwards to the river (where there was to be a piazza on a new riverside terrace or embankment extending from Westminster nearly to the line of the present Hungerford railway-bridge), and westwards into St. James's Park, where he planned a fine parterre. Here he made use of the then existing Canal (since destroyed to make the present ornamental lake) and planned a short canal from the west end of the parterre to the then existing (and still existing) Mall. The space between these two wide canals was to be occupied by a formal garden. Other and narrower canals surrounded the whole perimeter of the palace on north, south and west.

The north-south axis of the Banqueting House was prolonged northwards to the northern front of the palace, facing Charing Cross, and the connection with Charing Cross was contrived by slightly diverting that street from Charles I's statue (still existing) to the north entrance to the palace. A

triangular piazza was to be formed here to mask the diversion of the axis and to make a formal approach. South of the palace, the north-south axis was prolonged through a wide corridor right across the then existing Privy Garden and Bowling Green to a new Parliament House. Here the axis was deflected so that it continued through the centre of Westminster Hall. Between the Hall and the new Parliament House was a new piazza, in which were two small buildings (possibly twin churches, as in the Piazza del Popolo at Rome), flanking the entrance to a wide road running west. Westminster Abbey was to be surrounded by a formal precinct, entered from the west. Wren's plan ignores the church of St. Margaret: possibly he intended to demolish it, but his scheme would not necessarily involve its destruction.

The whole conception was magnificent, but the weakest feature of it was Wren's proposal to add a colossal portico on the east side of the Banqueting House, 100 ft. high, and to place a florid dome on either side of it, north and south. These ostentatious features are more in keeping with Bernini's style than Wren's own. They suggest a desire, either on his part or on the part of his royal clients, to be grand at all costs; and we may be thankful that in this case, as in certain others, his fancies were not fulfilled. The central block of the palace, west of the Banqueting House, was also colossal, but in that position magnificence was justified, if not indeed demanded. The outer wings, especially that towards Charing Cross, were notably reticent and plain, with rows of rectangular windows in four storeys. Wren's fourth scheme, also prepared in 1698 as an alternative, had its east-west axis south of the Banqueting House, with a four-column portico *in antis* as its central feature facing the Park. On either side of this feature were two identical blocks: one was the Banqueting House, the other matched it. This scheme was inferior to the third design, and neither was ever carried out.

Work at Windsor Castle

Wren was appointed Surveyor General in 1669, but the extensive alterations to Windsor Castle for Charles II which were commenced in 1673 were carried on by Hugh May till that architect's death in 1684, when Wren took over the final stages of completion of the State Apartments. The planting of 240 young elms as the beginning of the Long Walk in Windsor Great Park had then already begun. For James II, Wren built a new guard-house and undertook various works of repair and maintenance; but it was not until 1698 that he produced the grandiose scheme illustrated in my plan (Fig. 3), which is based upon his beautiful drawings in the All Souls' Collection at Oxford. This design involved the demolition of most of the south side of the Upper Ward, in order to make room for an imposing range of new royal apartments, 200 ft. long, with a great central gateway aligned through a new Italian garden on to the Long Walk. New or remodelled wings doubled the length of this south front.

On the north of the Upper Ward, Hugh May's comparatively new block remained intact, but from its centre an axial line (*not* continuous with that on the south) was projected through a sequence of stately terraces, parterres, and ornamental canals to the bend of the river near Romney Lock. Excluding the Long Walk itself, this vast layout stretched nearly a mile from north to south. Another line of parterres ran eastwards in the direction of the present Victoria Bridge. The Middle Ward was also to be formalised, and the Keep (the "Round Tower") was to be approached from the Upper Ward by an immense double flight of steps flanked by two monumental gateways. In the Lower Ward, the quaint Horseshoe Cloister was to be demolished, and an opening made in the outer walls between the Bell Tower and the Garter Tower, giving a vista of the west end of St. George's Chapel from Thames-street.

Wren's designs for the elevations of the new south block were uncompromisingly Italian in character, and made no concession whatever to the mediæval setting. He evidently appreciated St. George's Chapel sufficiently to wish to isolate it, and to provide a vista of it from the town; but in other respects his proposed treatment of the Castle was rather ruthless. It must be remembered, too, that, quite apart from this comprehensive scheme of remodelling, he had prepared in 1678 a design for an imposing domed mausoleum for Charles I, to be erected east of St. George's Chapel, which it would have dwarfed completely, the rotunda being 90 ft. high and 60 ft. in diameter. On balance, and with due regard to the lamentable standard of some of the early nineteenth-century work at Windsor, one must be thankful that Wren's scheme remained a "castle in the air."

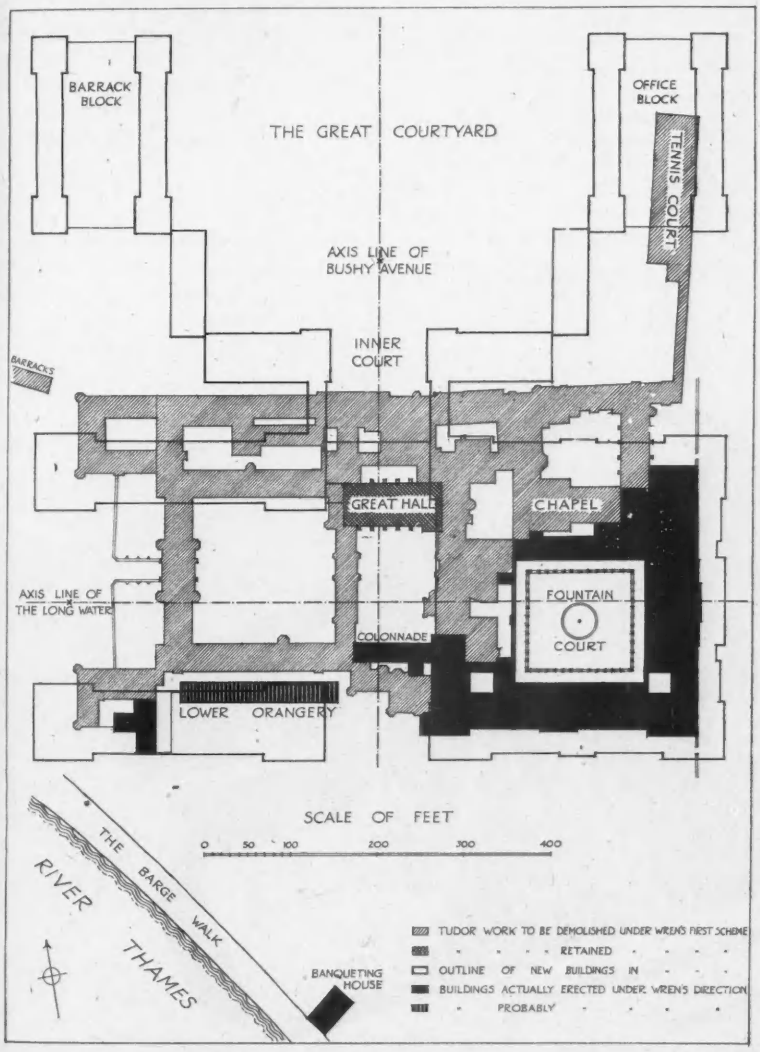


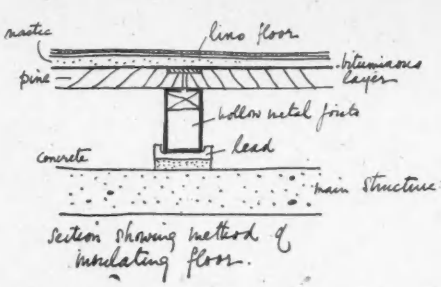
Fig. 4.—Wren's first design for rebuilding Hampton Court Palace, 1689, also showing later scheme as actually erected

Hampton Court Replanned

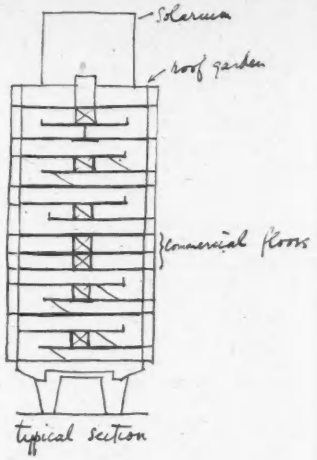
At Hampton Court, as at Whitehall, he proposed to demolish almost the whole of the rambling, picturesque and historic palace erected by Wolsey and Henry VIII between 1514 and 1540, retaining only the famous Great Hall. From 1540 to 1689, very little had been done to this Tudor palace, except the construction for Charles II of the fine canal known as the "Long Walk," and the avenues flanking it, radiating from the centre of the east front. William and Mary, however, fell in love with the place at sight when they paid their first visit there ten days after their coronation. The Queen was a most energetic young woman, who hated Whitehall as much as her husband did. They immediately sent for Wren, and hustled him so unmercifully that within a few weeks he pro-

duced the terrific design illustrated in my Fig. 4. This project is based upon two axial lines, one running east and west from the newly-constructed "Long Water" through the centre of the east front, the other north and south through the Tudor Great Hall, and continued along the line of the present "Chestnut Avenue" in Bushy Park. The size of the new building was huge, measuring about 780 feet square—that is, double the size of the present palace, including the "William and Mary block." The principal entrance was to continue to be from the west, as it is to-day, and on that side there was to be an enormous entrance court. My drawing gives some idea of the magnitude of the project, but naturally fails to show the Baroque dignity and splendour of the architecture. With the incredible energy and dash that he displayed in all his work, Wren prepared another alternative scheme in the grand manner, then the much reduced and truncated scheme that was finally carried out, and had actually started excavating the foundations within three months of his first meeting with his redoubtable pair of royal clients.

The relation of this so-called "William and Mary block" to his first project, and also to the old Tudor palace, is clearly shown on my plan. As for his "castle in the air," it is interesting that he valued the Tudor Great Hall so highly that he made it the centre-piece of his whole scheme, while he was prepared to demolish so much else that had great artistic merit as well as historical significance. One wonders if this was his own choice or whether it was urged upon him by his employers? The net result of this brief survey is to temper our admiration of Wren's magnificent schemes with a possibly heretical regret that they make him a potential candidate for our national roll of iconoclasts.



Section showing method of insulating floor.



typical section

CORBUSIER AT MARSEILLES: The "Unité d'Habitation"

Described and Illustrated by H. FRANK HOAR, B.A., F.R.I.B.A., A.M.T.P.I.

THIS project, when I saw it in September, had reached a stage where the main reinforced concrete frame was almost complete, and the various flats, shops, etc., were about to be inserted. One "show" flat had been finished and furnished and could be viewed by visitors.

It may be of interest to relate the history of the project. Plans were commissioned by the Ministry of Reconstruction in 1945, and four different sites were selected at Marseilles, for which separate designs were evolved.

Scheme 1

The first site proposed was to the north of the city at La Madrague, of irregular shape, and a considerable differentiation in levels. Le Corbusier proposed the construction of three blocks:

(a) for flats facing east, south and west,
(b) for flats facing south only,
(c) for maisonettes facing south.

Accommodation was to be as follows:

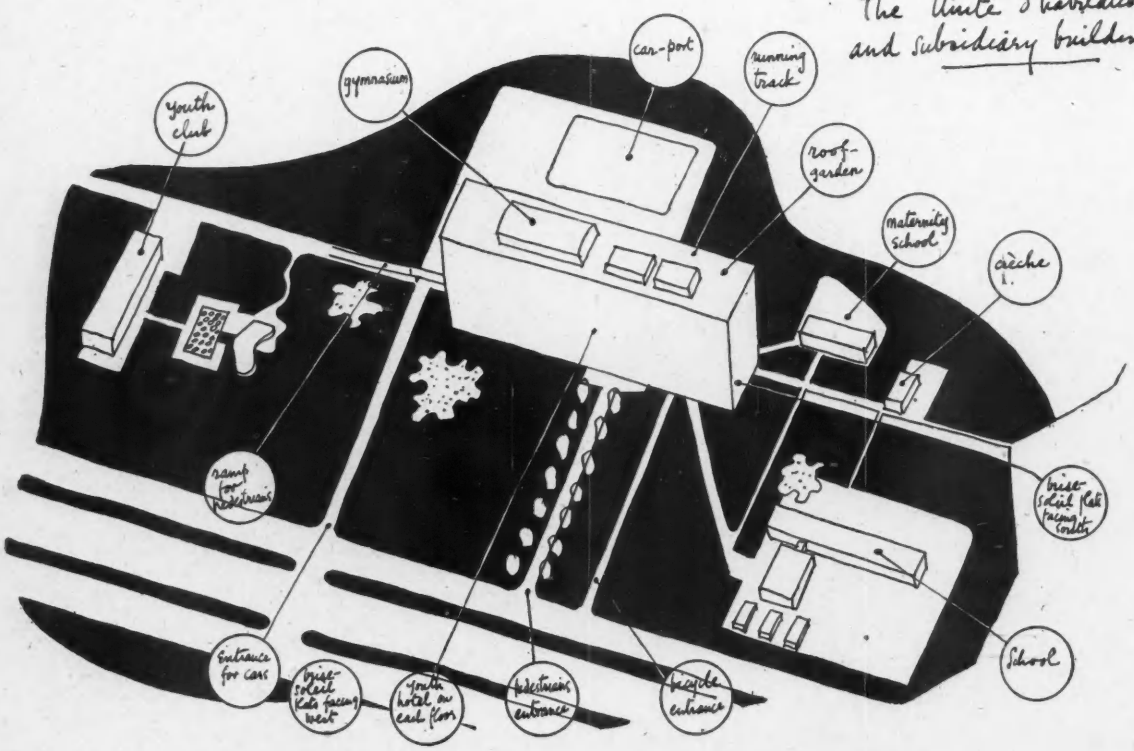
Block (a)	218 flats	—	962 residents,
(b)	108 flats	—	479 residents,
(c)	32 flats	—	192 residents.
Total:	358 flats	—	1633 residents.

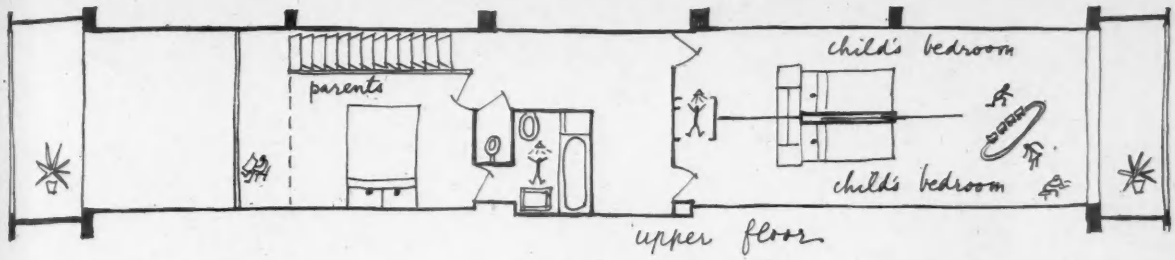
Area of site: 2.650 hectares.

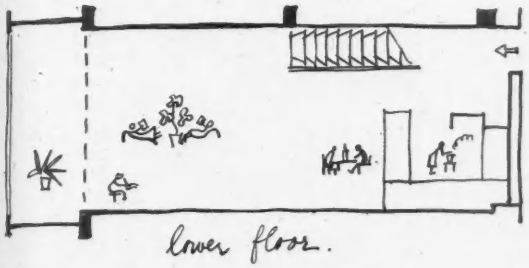
Density: 600 residents per hectare.

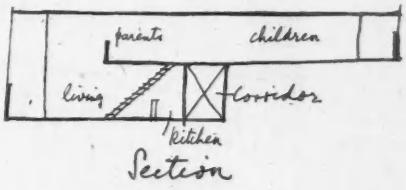
Various additional buildings were proposed. There were to be clubs and com-

The "Unité d'habitation and subsidiary buildings









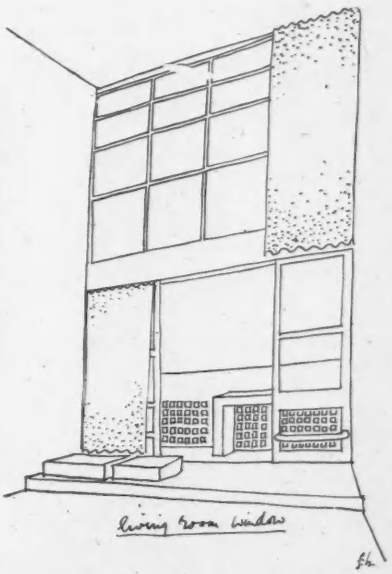
munity centres, a maternity school and nurseries, gardens, swimming pool and playing fields, a car park, a garage beneath, and separate road for heavy traffic. Le Corbusier argued that a residential unit such as he envisaged, together with its satellite buildings, formed an entity which in itself must form a distinct and self-sufficient part of the future town. This idea he followed on each of the sites.

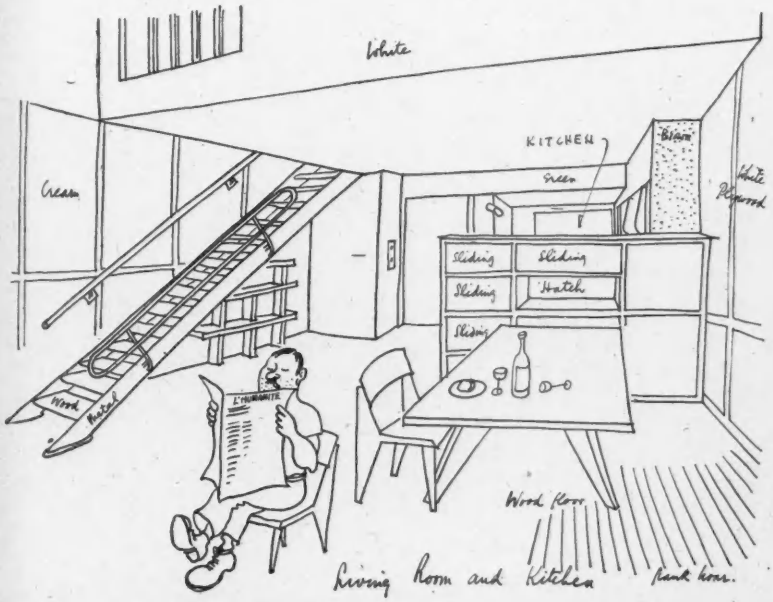
Schemes 1 and 2

The site at La Madrague, however, proved somewhat inaccessible. In the autumn another site was selected along the Boulevard Michelet, to the south of Marseilles, a flat site without trees and surrounded by small houses. The Boulevard itself is a magnificent artery some 140 feet in width, with four avenues of plane trees. A scheme was evolved on the lines of the sketch, and tree planting was given added attention. A road for cars led to the car park and garage at the rear. A pedestrian way and a separate road for cycles leading to a cycle park in the basement were also planned. After full sketch plans had been prepared, the site was refused by the municipal authorities, who wished to use it for another purpose.

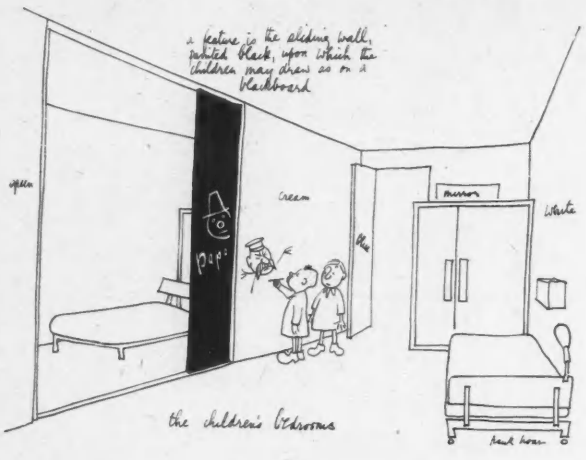
The Final Scheme

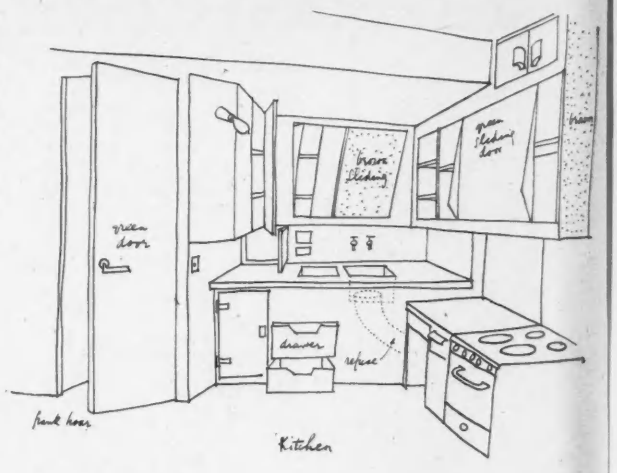
A further site was proposed to Le Corbusier in the St. Barnabas quarter. This comprised a large garden and orchard from an estate in an area of small houses. Finally, another site on the Boulevard Michelet was proposed and on this the present scheme was erected. This, fortunately, happened to be the best of the four. It is well treed, levels are good and services excellent.





The building runs due north and south, the window openings facing east and west. The north wall is blank. Subsidiary buildings are projected, as already mentioned, with separate entrances from the boulevard for cars, cycles and pedestrians. Prams will be lowered to their special garage in the basement by lifts specially reserved for this purpose in the main entrance. Bicycles can be ridden to their parking place in the basement by a ramp. Deliveries of goods to shops and flats is by goods lift behind the fire escape stairs to the north.





Thirty-six legs, each supporting 1,500 tons, carry the building. This has the effect of lightening the appearance of the massive block. The main entrance hall includes batteries of lifts, and a porter and messenger boys are stationed there. There is a special entrance for the delivery of coffins.

The Commercial Centre

The commercial centre is placed on two floors half-way up the building (see Section). The higher floor has food shops at the north end, with tailors' shops and shops for mending and pressing clothes at the south end. There are a few bachelors' flats and a laundry. The lower floor has shops for hairdressers, chemists, florists and stationers. There are hotel rooms on this floor for guests, thus obviating the need for a spare bedroom in the flats. There are a restaurant and a cafeteria.

Ice for the whole building is made in the basement and delivered to flats through an opening from the corridor to the kitchen. No separate refrigerators are necessary, and a considerable item of expenditure is thus cut out.

The Health Centre

On the 17th floor the southern half is reserved for a health service, beneath the roof garden. There are a dispensary, a children's garden, nursery and crêche, a tearoom and large halls for educational plays. Access from this floor to the roof garden is by ramp, where an open-air garden is reserved for the use of children.

The roof garden has an area of about half an acre. There is a running-track and a gymnasium and solarium. A parapet about 5 ft. high surrounds the garden as a wind protection, but is perforated to allow views over the city. There is a play space for children with a sand-pit and a paddling pool with artificial rain. A corner of it is covered for shade from the summer sun.

Construction

The main frame is of reinforced concrete, and prefabricated units are employed extensively throughout. Each flat is constructed completely independent of the main building and sound insulation has been carefully studied. Each is of light prefabricated timber construction, the metal floor joists resting on lead plates. Even the windows are attached to the separate cells and not to the main frame. Heating is by hot and cooling by cold air.

COMPETITION NEWS

"The Builder" Low-cost Housing

THE CLOSING DATE for this competition is Wednesday next, January 17, by which date designs must be deposited at this office; 454 sets of conditions have been applied for.

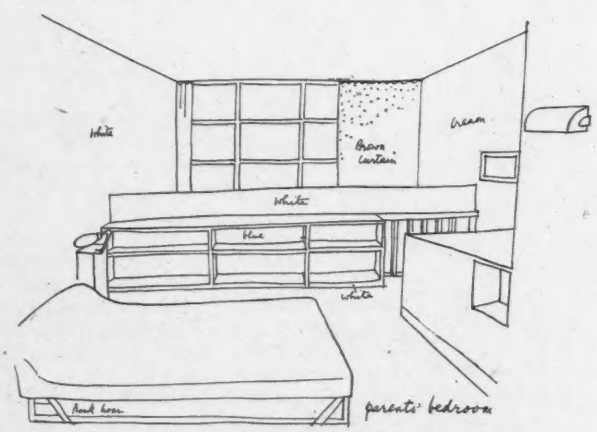
Festival Hall, Heswall, Wirral

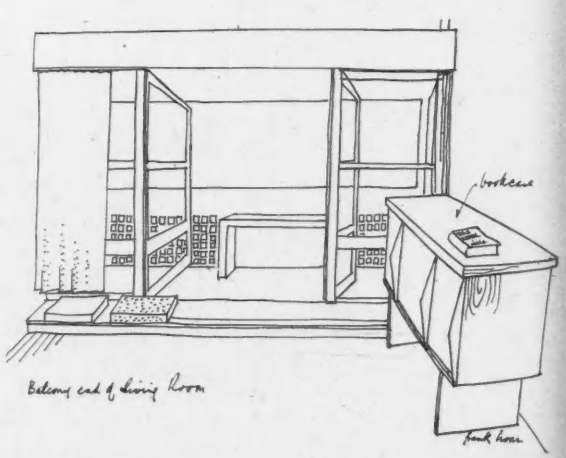
ARCHITECTS are invited by the Wirral U.D.C. to submit designs in competition for a Festival Hall to be built at Heswall, Cheshire. Premiums of £500, £350 and £250 are offered. Mr. P. Garland Fairhurst, M.A., F.R.I.B.A., is assessor. Conditions are obtainable from the Clerk of the Council (Mr. W. F. Roberts), Council Offices, Heswall, Wirral, Cheshire, on deposit of £2 2s., to whom questions should be addressed by February 8, and to whom designs must be sent by April 28.

COMPETITION OPEN

COVENTRY CATHEDRAL. Promoted by Coventry Cathedral Reconstruction Committee. Premiums: £2,000, £1,500 and £1,000. Assessors: Sir Percy Thomas, P-P.R.I.B.A.; Mr. Edward Maufe, R.A.; and Mr. Howard Robertson, A.R.A. Conditions from: The Secretary, Coventry Cathedral Reconstruction Committee, 22, Bayley-lane, Coventry. Dep. £2 2s. Last day for questions: December 13, 1950. Closing date for designs: July 2, 1951. *November 3, 1950.*

Date in italics at the end of paragraph refers to issue of "The Builder" in which details of the competition appeared.





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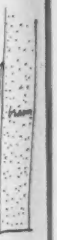

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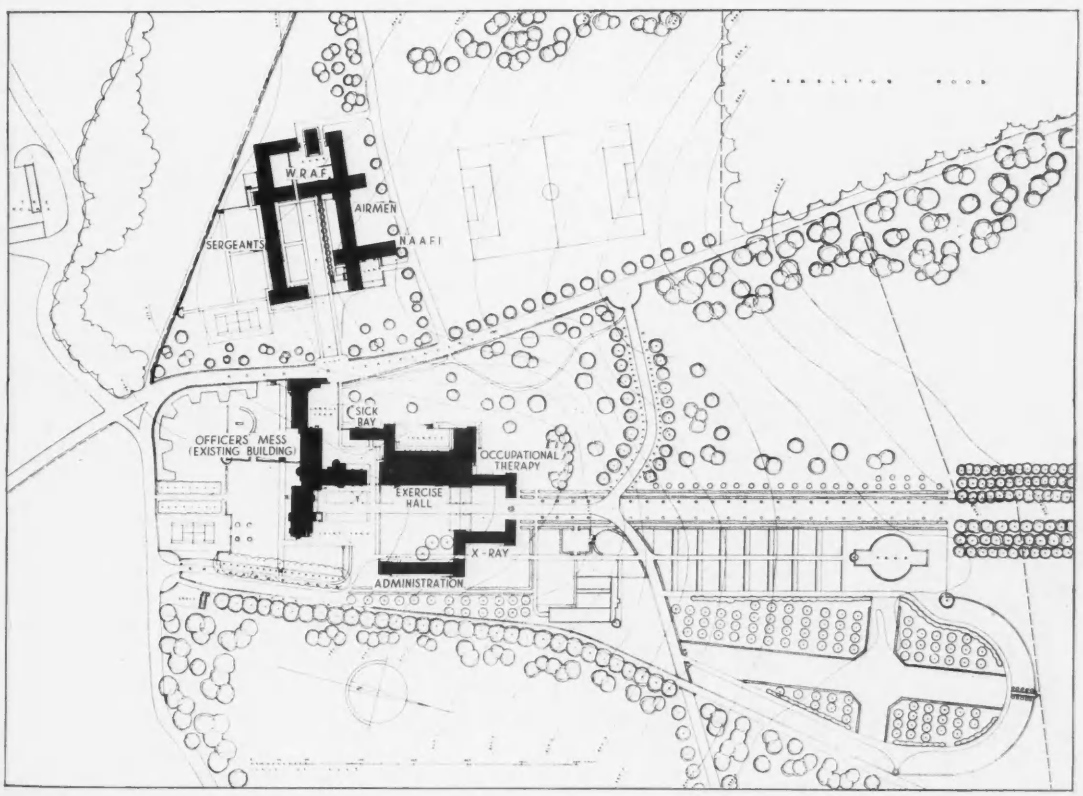
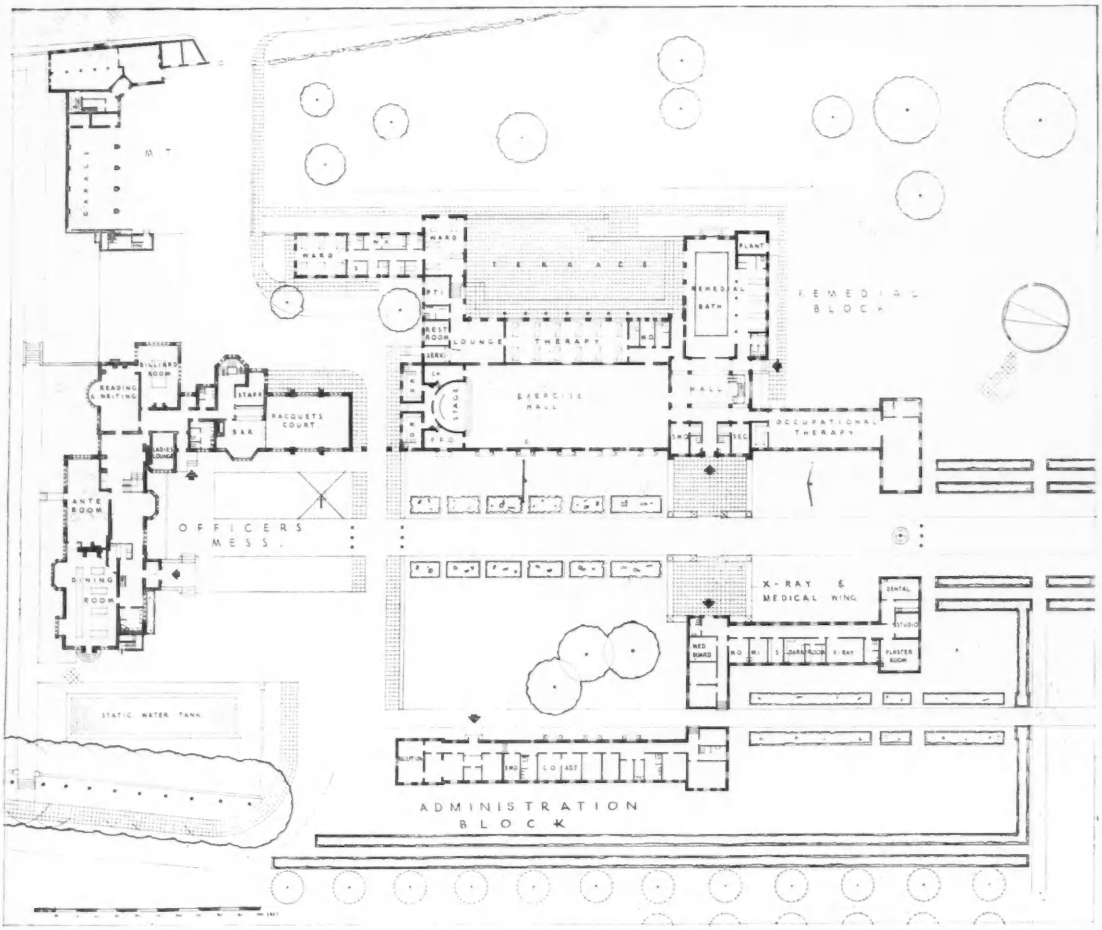
The Centre, from a model, showing existing house and new main buildings. *Below :* **General layout**

R.A.F. REHABILITATION CENTRE

HEADLEY COURT, SURREY

ARTHUR W. KENYON, C.B.E., F.R.I.B.A., M.T.P.I., ARCHITECT





Plan of remedial and administration blocks, showing relation to officers' mess

IN the medical science of rehabilitation, probably more than in almost any other branch of healing medicine, the psychological factors of environment and of cheerful surroundings play a major part. Without the proper atmosphere, the work of the doctor is made harder and, throughout the whole period of design and construction, every consideration has been given in the closest collaboration between the medical side and the architectural to give the right feeling to the building.

The officers' mess bar

The problem, quite probably, has in this case been made much easier for the architect, as this is the first R.A.F. rehabilitation centre to be built as such, and, therefore, he was able to give full vent to his ideas.

That a special unit could be built for rehabilitation at this stage is due very largely to the generosity of the members of the Chartered Auctioneers' and Estate Agents' Institute. During the war they established the R.A.F. Pilots' and Crews' Fund and raised over £384,000 as a tribute to the deeds of the Royal Air Force in the Second World War. Of this fund over £200,000 has been used in making grants to former flying personnel and their children. The balance of the fund was devoted by the Chartered Institute to the establishment of a permanent rehabilitation centre—Headley Court, a large country house built in 1890 in the Jacobean manner and set very pleasantly in its own grounds, being settled on. The terms of reference laid down that the centre was for aircrew, which, at the date of designing the buildings, meant officers and sergeants, and the design very rapidly fell into five sections :

(1) An officers' mess for 50 officer patients and 15 officer staff ; (2) a sergeants' mess for 50 sergeant patients and 10 sergeant staff ; (3) living accommodation for 75 airmen staff (including both men and women) ; (4) an administration unit ; (5) a remedial block.

It was, therefore, decided that there would have to be a number of separate buildings to fulfil the various functions,

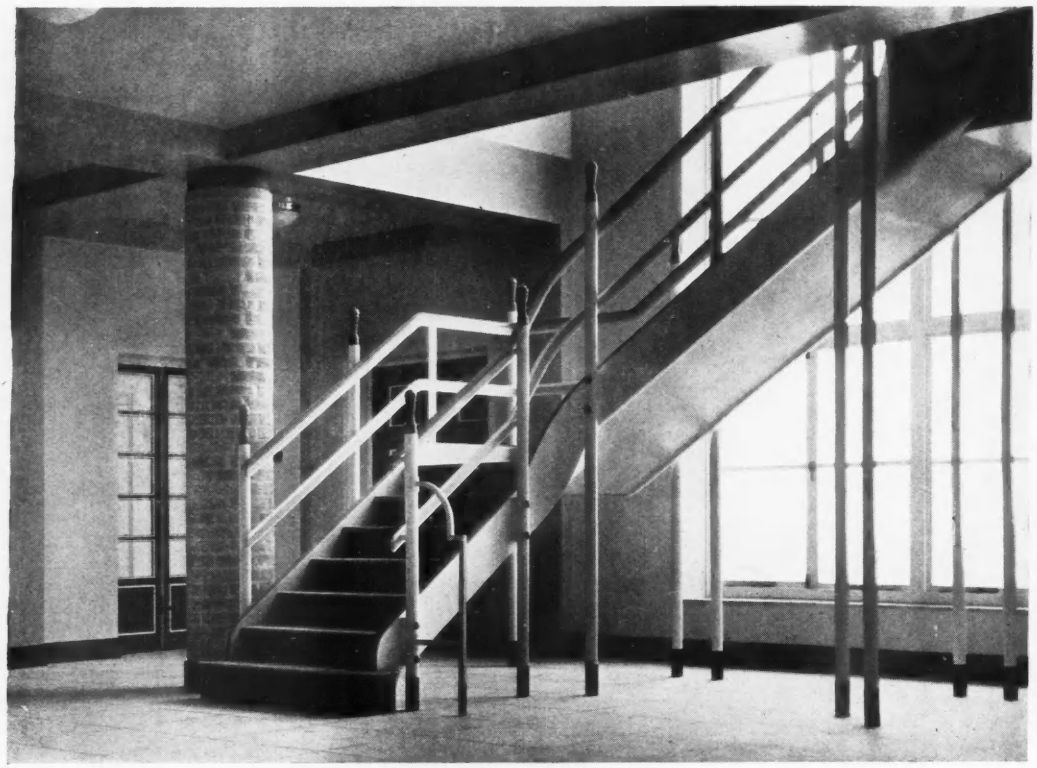
Photographs by Sydney W. Newbery

The remedial block: the main entrance and (*below*) **the main front**

and eventually, as can be seen from the block plan, these developed into :

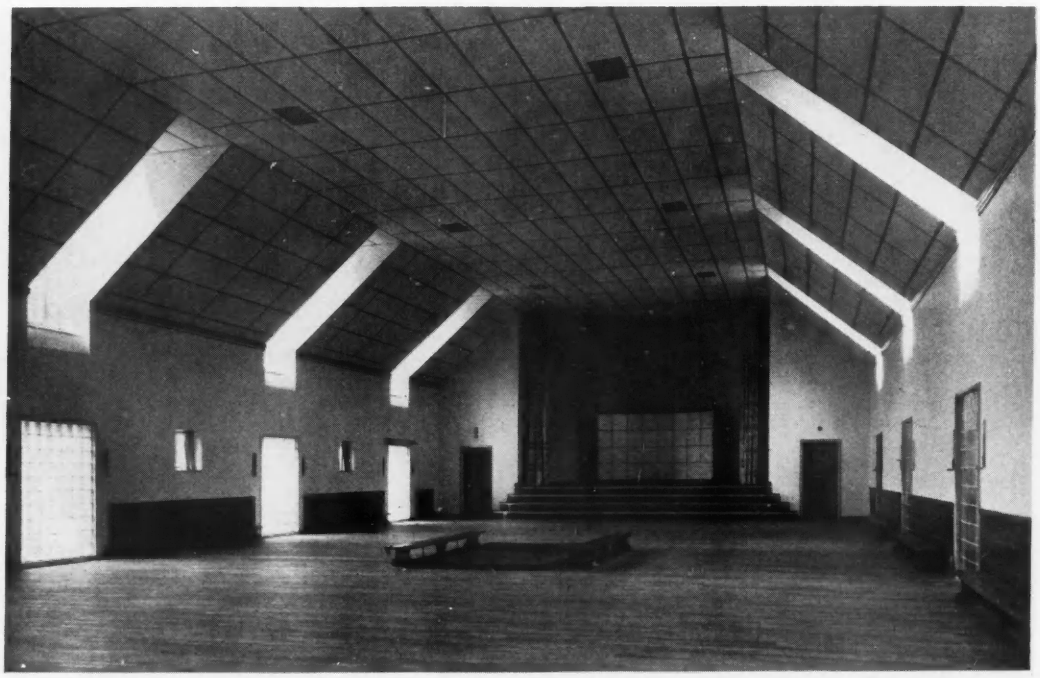
(1) Using the existing house as an officers' mess ; (2) a remedial block, with a small administration block adjacent to it and forming a quadrangle ; (3) a block comprising in part the sergeants' mess and in part the airmen's quarters and forming a further quadrangle.

The Officers' Mess : The existing house was chosen as



Main entrance hall, showing entrance to remedial bath *Below :* **Exercise hall**

the officers' mess as being the most suitable use to which it could be put. On the ground floor, the main rooms were panelled out in dark wood, which, with the heavy stone mullions and leaded lights, made the rooms somewhat drab. In the dining-room, ante-room and ladies' room, therefore, the panelling was stripped and bleached to a light



oak colour and with light-coloured furniture has resulted in cheerful rooms. The main light fittings, which are always difficult in this type of house, were specially designed by the architect. The room to be used as a bar was given a modern treatment, though made to fit in with the general tradition of the house. The dado is in the form of chevron panelling, with bleached and waxed ply panelling over. The chevron panels are painted. From the bar a view may be had into the racquets court.

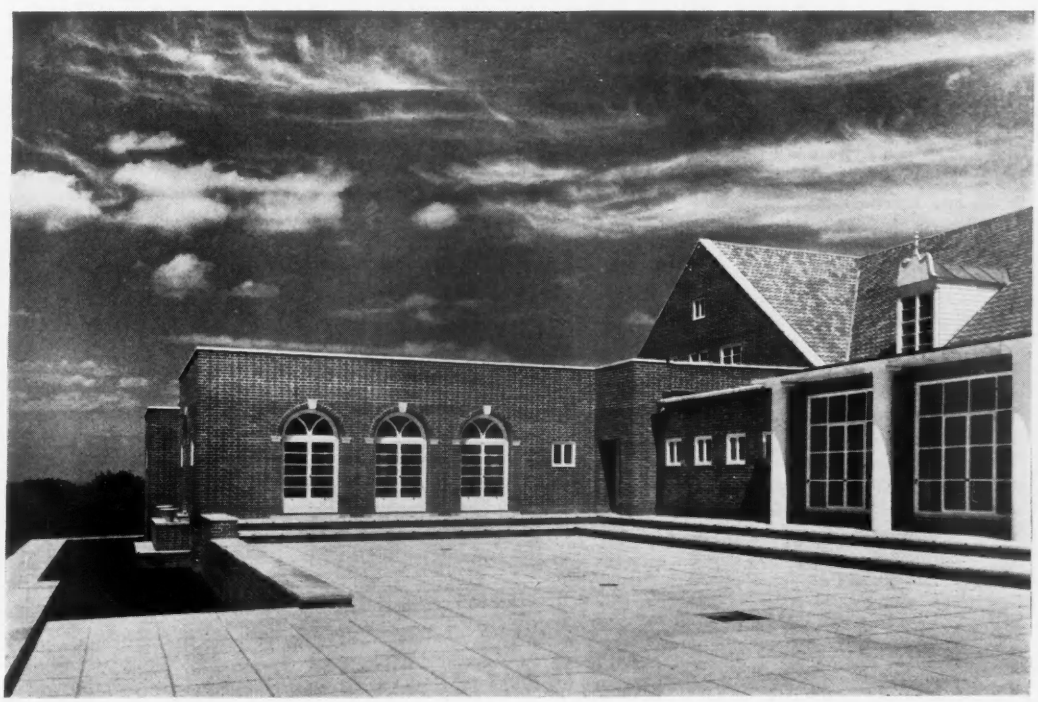
Boiler House : The whole of the job is heated from one central boiler house. Space was found in a sub-basement of the main house for this and by some ingenuity the boiler flue made practically inconspicuous alongside the main house.

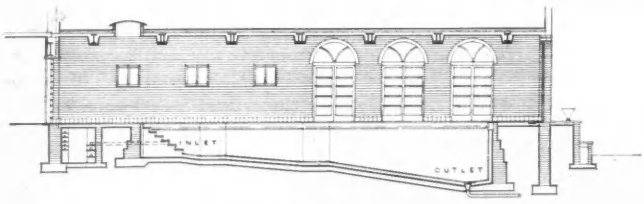
Remedial Block : The remedial block is the heart of the centre. The main medical requirements were for a large exercise hall, a remedial bath, a physio-therapy and occupational therapy department, all *en suite* with each other and appearing as a hive of activity. Practically all the patients spend most of their day in the remedial block and space was, therefore, allowed for a large entrance hall in which they could congregate and from which all the various activities branch off. The working centre of this block is the exercise hall, which is one of those types of halls which have to suit all manner of activity. Normally, it is used by a number of classes at once doing various remedial exercises or playing volley ball, etc. A stage platform was asked for, on which part of the class could perform.

Above the entrance hall on the first floor is a further exercise hall. The main hall will also be used for social activities. It is fitted with electrically-operated stage curtains and provision has been made in the wiring for some stage lighting and for 16 mm. cinema equipment. At the back of the stage are two dressing-rooms.

Remedial Bath : The second method of rehabilitation

The physio-therapy department. *Below :* **Terrace outside the remedial baths. On the right is the physio-therapy department**





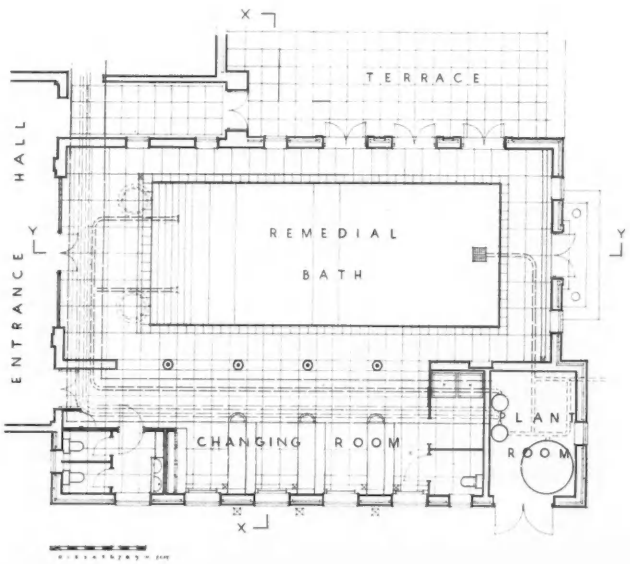
SECTION Y-Y

Physio-therapy: The major part of the treatment side is in the form of physio-therapy, and a large room has been planned for this. Physio-therapy in small cubicles has, in the experience of at least one R.A.F. clinic, led to a loss of efficiency due to a lack of rapid supervision. For patients who must be screened, mobile screens or curtains can be provided.

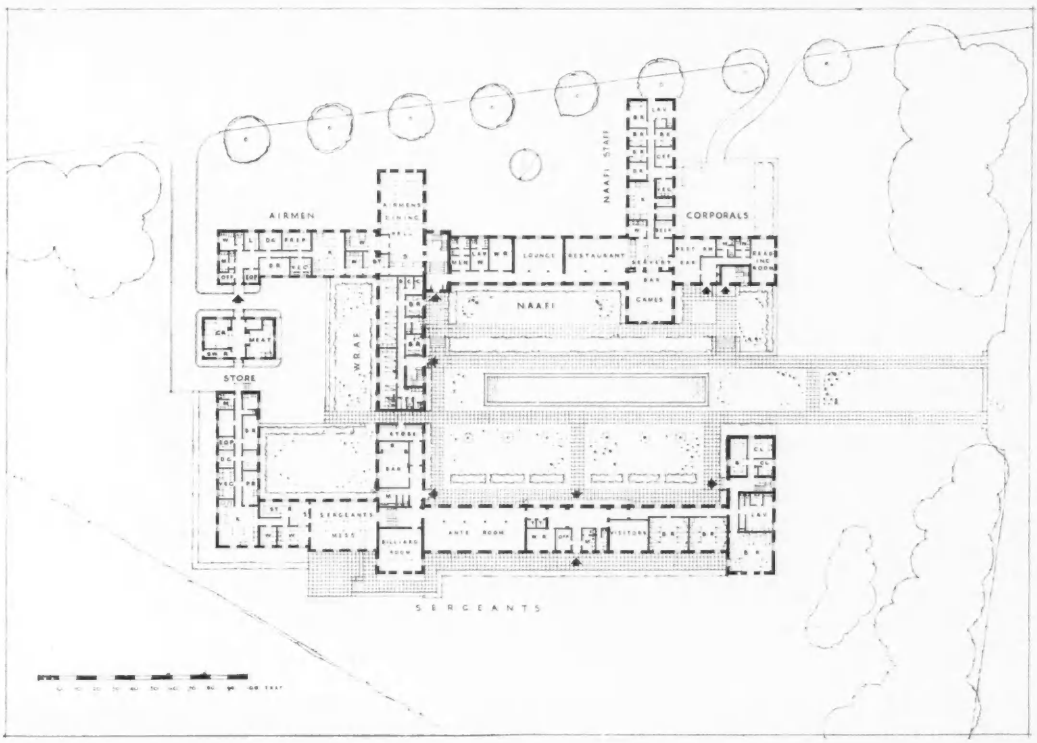
The remedial bath, with dressing-rooms beyond

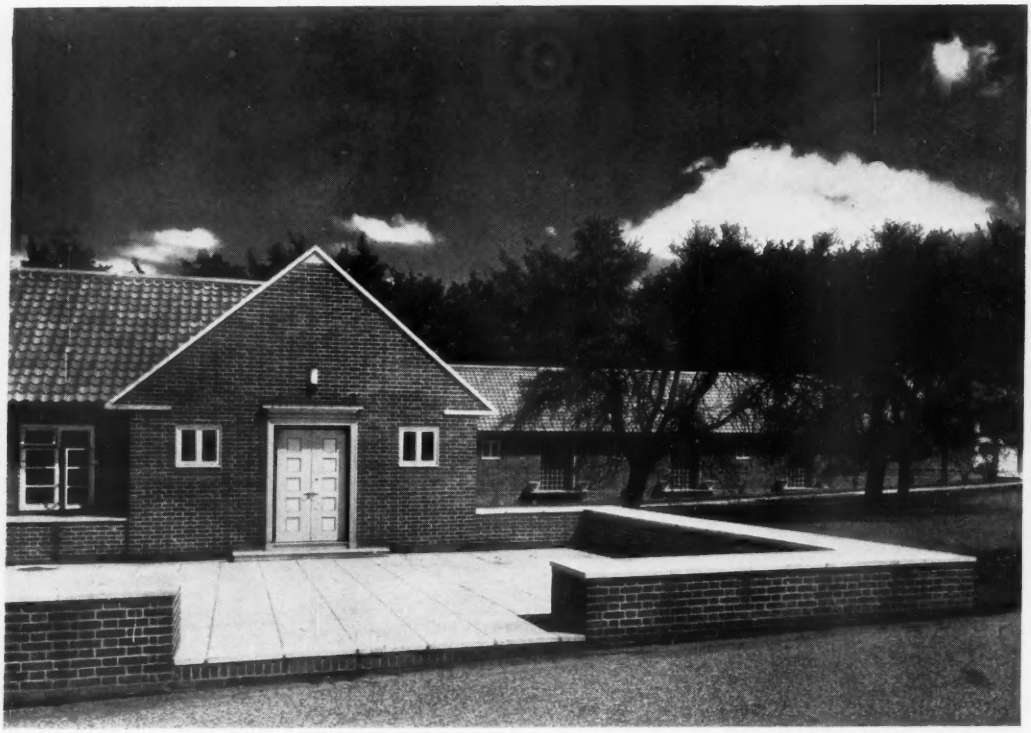
used is exercising patients in a remedial bath. The walls are in natural facing bricks and the floor and ceiling are panel heated, the ceiling being finished in a special plaster to prevent condensation. At the shallow end of the bath is a flight of steps the full width of the bath, giving ease of entry to such as paraplegics and also acting as a seat on which patients may sit to perform leg exercises. Most of the bath is less than four feet deep, and, as can be seen from the section, there are two level platforms running across the bath made clearly discernible by being in coloured tiles. On these level platforms patients can practise walking.

Outside the bath and opening into it (but also approached by other doors) is a large terrace 100 ft. by 40 ft. (the same as the exercise hall) to which, in the summer, all the activities normally held indoors can be transferred.



View into main courtyard of accommodation block. *Below* **Ground-floor plan**





View of administration block, with X-ray on the left, from west

Occupational Therapy : This block is again approached from the entrance hall, but can be segregated so that patients or staff can go there in their own time.

Sick Bay : Attached to the remedial block, but not part of it in planning, is the sick bay. This is a simple form of sick quarters with two wards, one of five and the other six beds, small ward kitchen, lavatories, sister's room, etc.

The X-Ray and Medical Wing : Provision has also been made in the unit for X-ray and clinical photography and a medical section. X-ray photography plays a great part in the doctor's diagnosis and clinical photography is used for documentation purposes.

Administration Block : This consists solely of the normal offices one expects for airmen's papers, supervision, etc. One room, however, is of general importance to such a centre, namely, the reception. Here all the incoming patients are received, are made welcome and from here are taken to the various sections they have to visit on joining the centre.

Accommodation Block : This unit is designed to accommodate 50 sergeant patients, 10 sergeant staff, and 75 airmen staff, and, as can be seen from the plan, is in the form of two wings. In general, both sergeants and airmen are in bedrooms for 3, 4 or 5. Built-in wardrobes to Air Ministry standard are supplied and the airmen have bed-head lights. Sergeants have bedside tables and reading-lamps. Each unit has its own kitchens.

Sergeants' Mess : The principal rooms in the sergeants' quarters consist of ante-room, mess, billiard room, reading and writing-room and visitors' room.

N.A.A.F.I. : The planning of the airmen's quarters is somewhat more complicated than the sergeants', owing to the fact that their principal recreation rooms come under N.A.A.F.I., who are responsible for their running.

Airmen's and W.R.A.F. Quarters : In the domestic quarters, all the bedrooms are off continuous corridors, but various staircases and shut-off doors have been provided as the proportion of W.R.A.F. to airmen is never constant. As designed, it is possible to shut off, from the total of 75, accommodation for either 10, 25 or 40 W.R.A.F., this accommodation being entered from separate entrances.

The Associate-in-Charge under the Architect was Mr. P. B. Kenyon, M.A., A.M.I.C.E., A.M.T.P.I. The consulting engineers were Hoare, Lea and Partners, and the building contractors, Messrs. James Longley and Co., Ltd., of Crawley. Sub-contractors and suppliers were :

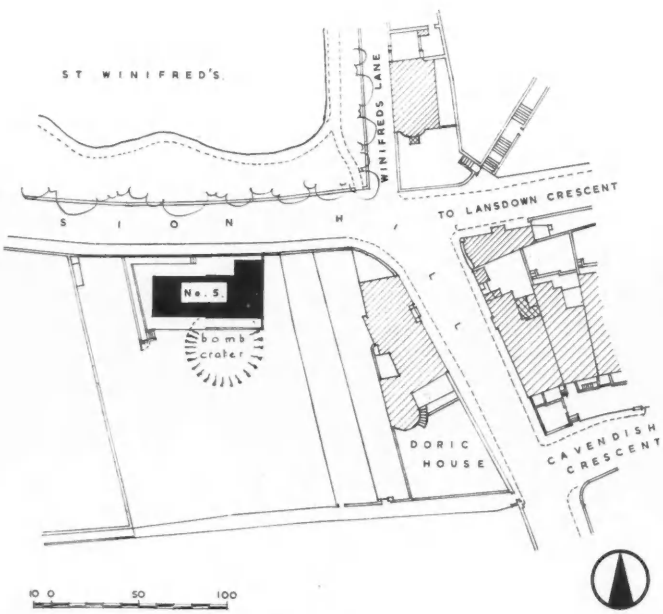
Heating—hot and cold water, William Freer, Ltd. ; panel heating, Benham and Sons, Ltd. ; remedial bath filtration plant, Pulsometer Engineering Co., Ltd. ; electrical—officers' mess, T. Clarke and Co., Ltd. ; main contract, Phœnix Electrical Co. (London), Ltd. ; special fittings in officers' mess, Falk, Stadelmann and Co., Ltd. (to architect's design) ; structural steel, Matthew T. Shaw and Co., Ltd. ; roof tiling, Henry J. Greenham (1929), Ltd. ; window controls (exercise hall), Arens Controls, Ltd. ; commemoration plaque, Heal and Son, Ltd. (who made, carved and coloured this) ; suspended ceiling to exercise hall, Sundeala Board Co., Ltd. ; metal work, balustrades, Light Steelwork (1925), Ltd. ; main entrance gates, T. Crowther and Son ; hollow tile floors, F. Bradford and Co., Ltd. ; wood block flooring and strip flooring to exercise hall, R. W. Brooke and Co. ; flagstaff, J. W. Gray and Son, Ltd. ; flat roof covering (bituminous felt), Permanite, Ltd. ; special paint colours in main rooms, Thos. Parsons and Sons, Ltd. (from their " Historical Colours ") ; wardrobes, Plysyl Formwork, Ltd., and John Sadd and Sons, Ltd. ; furnishing, Ministry of Works; cooking equipment and ironmongery, Ministry of Works Bulk Supply ; collapsible gates to N.A.A.F.I. bar, Bolton Gate Co., Ltd. ; swimming bath tiling and floor tiling, Carter and Co. (London), Ltd. ; terrazzo, Malacarp Terrazzo Co., Ltd. ; stone, Bath and Portland Stone Firms, Ltd. ; and lifts (in officers' mess), Aldous and Campbell. All the joinery, including windows, doors, panelling to officers' mess bar, etc., was done by Messrs. Longley. Bricks—generally, 2¼-in. handmade reds from Chigwell Road Brickworks ; and swimming bath, 2¼-in. handmade primrose/buff multi-facings—both supplied by Henry J. Greenham (1929), Ltd.

Dining-room in sergeants' mess. *Below :* **Airmen's restaurant in N.A.A.F.I.**

R.A.F. REHABILITATION CENTRE, HEADLEY COURT, SURREY

View looking up Sion Hill

SINGLE-STOREY HOUSE, No. 5, SION HILL, BATH, SOM.



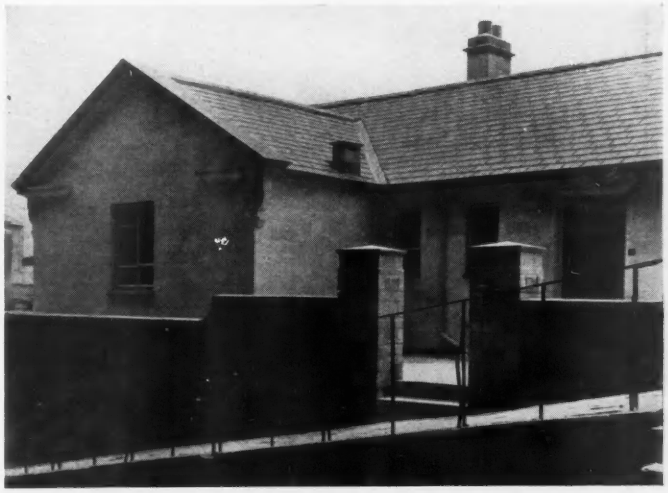
The site plan

ROLFE AND CROZIER COLE, L. & F.R.I.B.A., ARCHITECTS

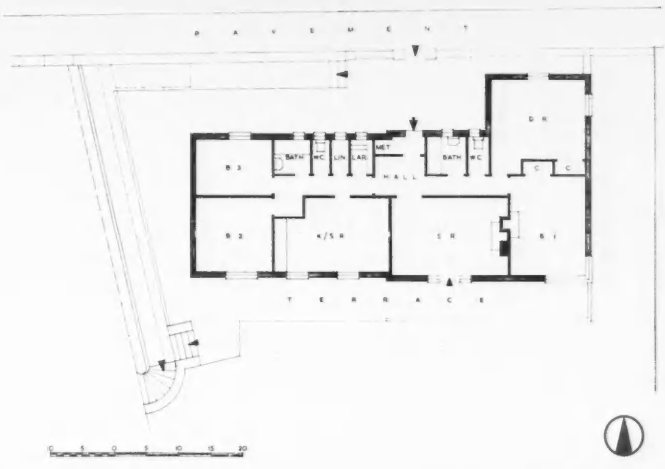
THIS bungalow, or "cottage ornée," was built in 1949 on the site of two houses which were demolished in the air raids of 1942. It is planned to provide separate accommodation for the owner and his housekeeper ; the previous buildings on the site were rather awkwardly planned. The design is intended to harmonise with Doric House (designed by Joseph Michael Gandy in 1810) and Cavendish Crescent (designed by John Pinch in 1817).

The debris which strewed the site was built into a platform over part of the bomb crater, and the remainder of this crater is being worked into the scheme for the garden. The bungalow itself is 1,385 sq. ft. in area; it has 10-in. cavity walls faced with 4 in. Bath stone rangework, and a slate roof. The standard metal windows have tiled cills, the ground floor being finished with "Semtex." Internal finishings are of the simplest character, except that the ironmongery is of very good quality. Hot water is supplied to all points, except the kitchen, by a 40-gal. Sadia in the roof space. The kitchen is served by a gas unit, incorporating cooker, refrigerator and water heater.

The builders were Messrs. G. Mannings and Sons, of Claverton Down, Bath, and subcontractors were : metal windows, Crittall Manufacturing Co., Ltd. ; floors, Semtex, Ltd. ; ironmongery, Yannedis and Co., Ltd. ; electrical installation, H. L. Bush and Co., Ltd.; and kitchen unit, "Aluplex" unit, South Western Gas Board, Bath.



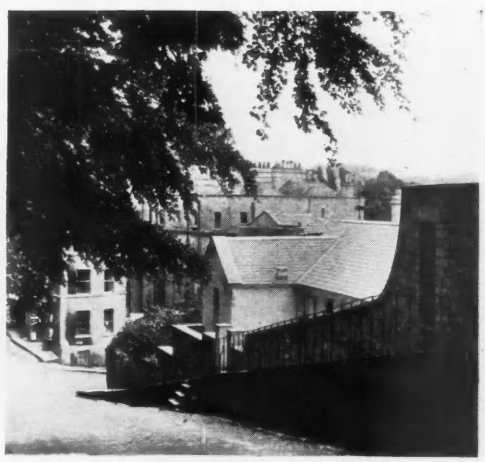
Detail of entrance



BUNGALOW AT No. 5 SION HILL · BATH ·

The plan

Looking towards St. Winifred's



Looking down Sion Hill

View from the south-west. *Below :* **The plan**

A NURSERY SCHOOL AT COOKHAM, BERKS

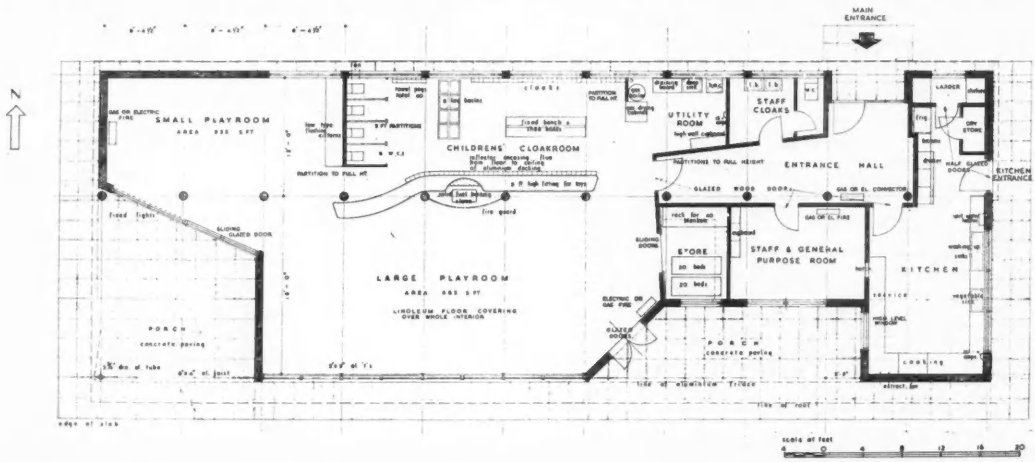
JOHN STILLMAN, A.R.I.B.A., ARCHITECT

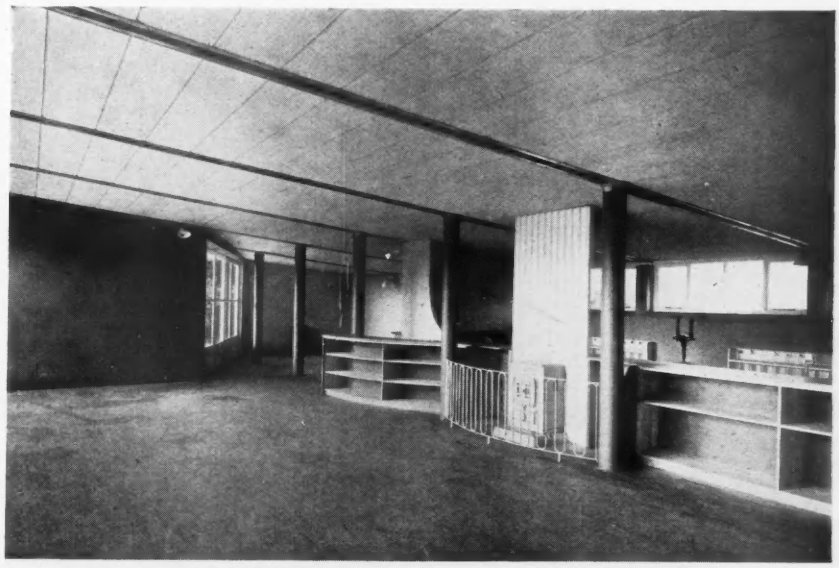
THIS nursery school, just completed at Cookham, Berkshire, is the first of a new design sponsored by the Nursery School Association of Great Britain. The plan was worked out by the Buildings Sub-Committee of the Association, and the design developed by Mr. John Stillman, A.R.I.B.A. Two further schools, each for 80 children, have recently been completed at Stoke-on-Trent, and another is under construction in Scotland.

The design aims at reducing the current cost per place of nursery schools, estimated to be about £400, by half, while at the same time providing essential requirements. The simplification of the accommodation follows closely on the recommendations of the Ministry of Education's Working Party Report on the Building Regulations, and on the practical experience of teachers.

The basis of the design is a self-contained nursery unit for 40 children. Where a unit is erected singly, as at Cookham, the kitchen is planned within the main structure ; it is, however, recommended that where possible, to achieve even greater economy, two such units should be erected side by side, and be provided with a single detached kitchen at the rear, as has been done at Stoke-on-Trent.

The main approach to the plan has been one of retaining maximum floor space where it is most needed for freedom of movement, and eliminating waste space resulting from dividing partitions and corridors, and also from the





The large playroom, looking towards the small one

The small playroom

Nursery school for the city of Stoke-on-Trent, recently completed (double type)

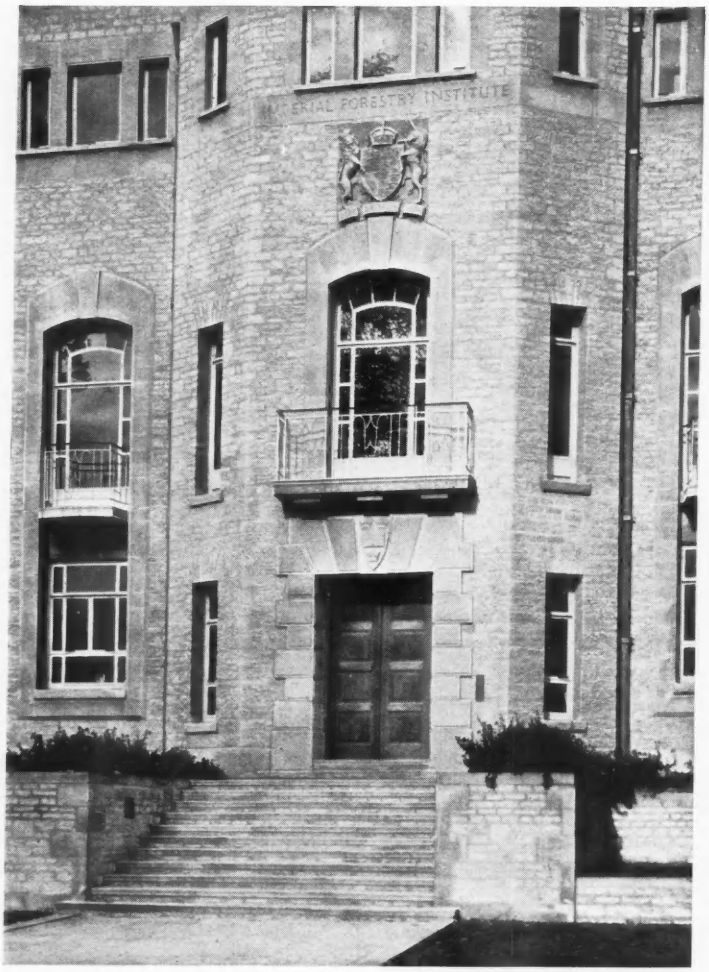
provision of separate cloakrooms for each playroom.

A choice of 6-in. hollow clay block, rendered externally and plastered internally, was made for walling, and the roof is of asbestos decking laid on aluminium box section upstand beams and covered with insulating board and built-up bituminised roof felt. It is supported at 10 deg. pitch on two rows of precast concrete columns running centrally the length of the building and in the rear wall, and on light aluminium " T " sections situated on the line of the south wall. Partitions are of 3-in. breeze block, plastered.

All doors and windows are of timber, and floors throughout are of linoleum. Porches have coloured concrete paving slabs. Heating is provided by a large closeable solid fuel burning stove supplemented with gas and electric convectors, used together for comparison. The water heaters (a storage unit for the lavatories, and multipoint in the kitchen) and the drying cabinet burn gas.

The main contractors were the Anglo-Scottish Construction Co., and the principal sub-contractors were :

Electric fans, Air Control Installations, Ltd. ; "Aquaseal" waterproof compound, Berry Wiggins and Co., Ltd. ; electric convectors, E. K. Cole, Ltd. ; gas water heaters, Thomas de La Rue and Co., Ltd. ; paints, Fleetwood Paints, Ltd., and Imperial Chemical Industries, Ltd. ; gas drying cabinets, J. Glover and Sons, Ltd. ; linoleum laying, B. Holden and Co., Ltd. ; precast concrete, Liverpool Artificial Stone Co., Ltd. ; wall blocks, London Brick Co., Ltd. ; plumbing pipes, S. R. Love and Sons ; gas services, North Thames Gas Board ; gas space heaters, Radiant Heating, Ltd. ; paving slabs, bricks and stoneware pipe, sanitary fittings, Roberts Adlard and Co., Ltd. ; lavatory partitions, Venesta, Ltd. ; cloakroom fittings, West London Iron and Wireworks, Ltd. ; and furniture, Kingfisher, Ltd., and Educational Supply Association.



Detail of main entrance, from South Parks-road

IMPERIAL FORESTRY INSTITUTE, OXFORD

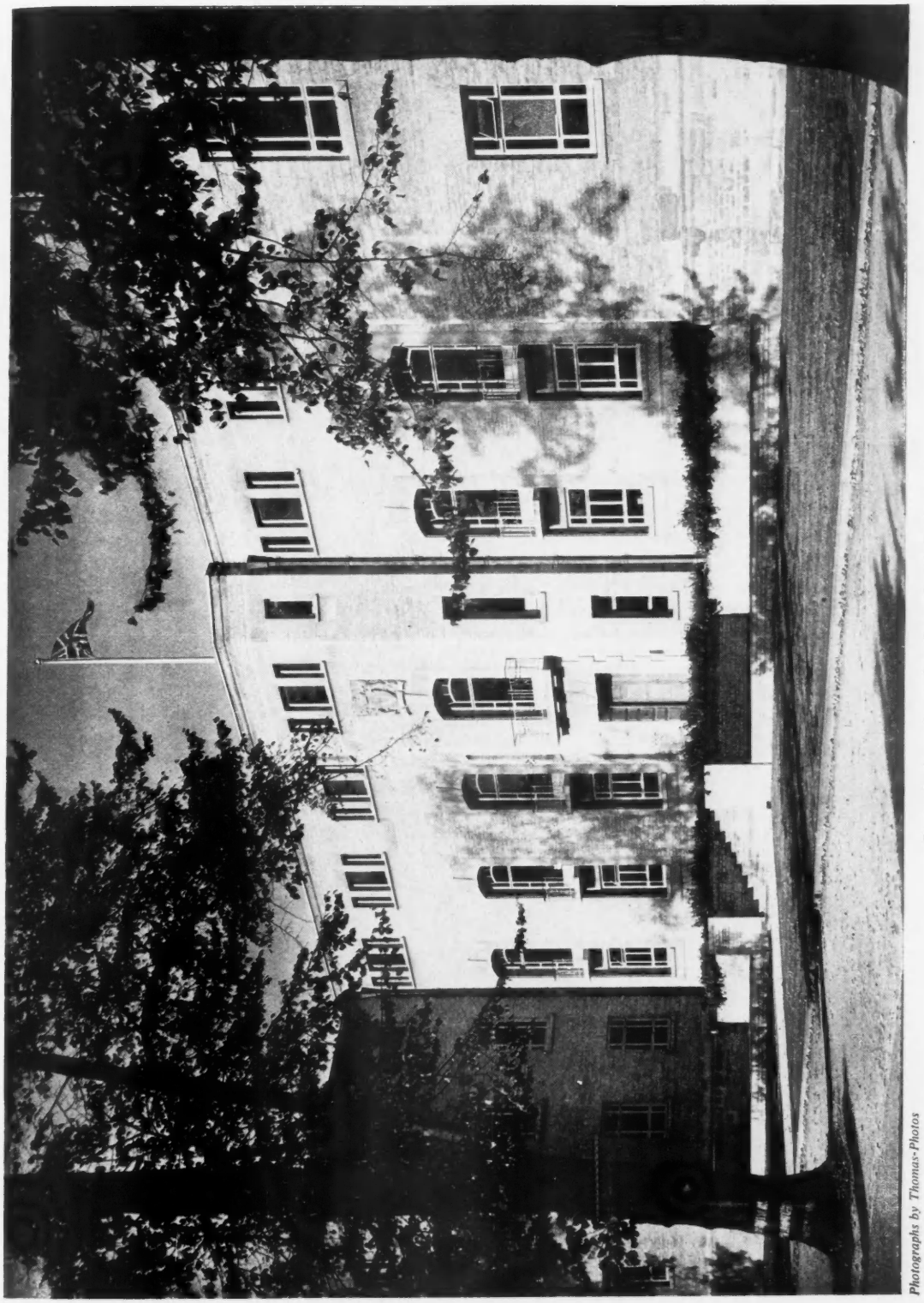
THOMAS WORTHINGTON AND SONS, ARCHITECTS

THE opening of this new building by H.R.H. Princess Margaret on October 19 saw the completion of a scheme to establish an Imperial Forestry Institute which first was proposed following the first world war as an Empire Centre for higher education and research in forestry which should be attached to the Oxford School of Forestry. The University allocated a site in the Science Area fronting South Parks-road, and after a good deal of delay, caused mostly through shortage of money, plans for a less ambitious scheme were drawn up by Sir Hubert Worthington, A.R.A. (of Messrs. Thomas Worthington and Sons). These aimed at providing at least the same area of floor space as was already in use in the existing scattered buildings, though the original idea of incorporating a large central museum was abandoned. Monetary gifts by the Rajah of Sarawak in 1930 and by the Rhodes and Pilgrim Trusts were added to by a grant of £45,000 by the Colonial Development and Welfare Fund, thus enabling a start to be made upon construction in 1948. An appeal for gifts of timber made through the fifth Empire Forestry Conference held in 1947 met with universal and generous response. Financial help in utilising these timbers was given by the University and help in arranging for the collection of the many different consignments and their conversion into their finished forms was given by Messrs. Wm. Mallinson and Sons, Ltd., and by Dr. L. Chalk, of the Institute staff.

The building is three-storeyed and is linked with the new Botany building through a lecture theatre shared with it. Space heating is provided through hot water from the Science Area system. Lighting varies according to special needs, but fluorescent tubes have been used in many rooms. There are three lecture rooms, of which the largest (shared with Botany) seats 110 persons. Workshops and laboratories are fully equipped. The oak meeting room (top floor) is for staff discussions, etc.

The quantity surveyors were Messrs. William Fishwick and Son, of Manchester, and the consulting engineers, Messrs. Handcock and Dykes, of London. The clerk of works was Mr. T. R. Davies. The general contractors were Messrs. Benfield and Loxley, Ltd., of Oxford. Sub-contractors and suppliers were :

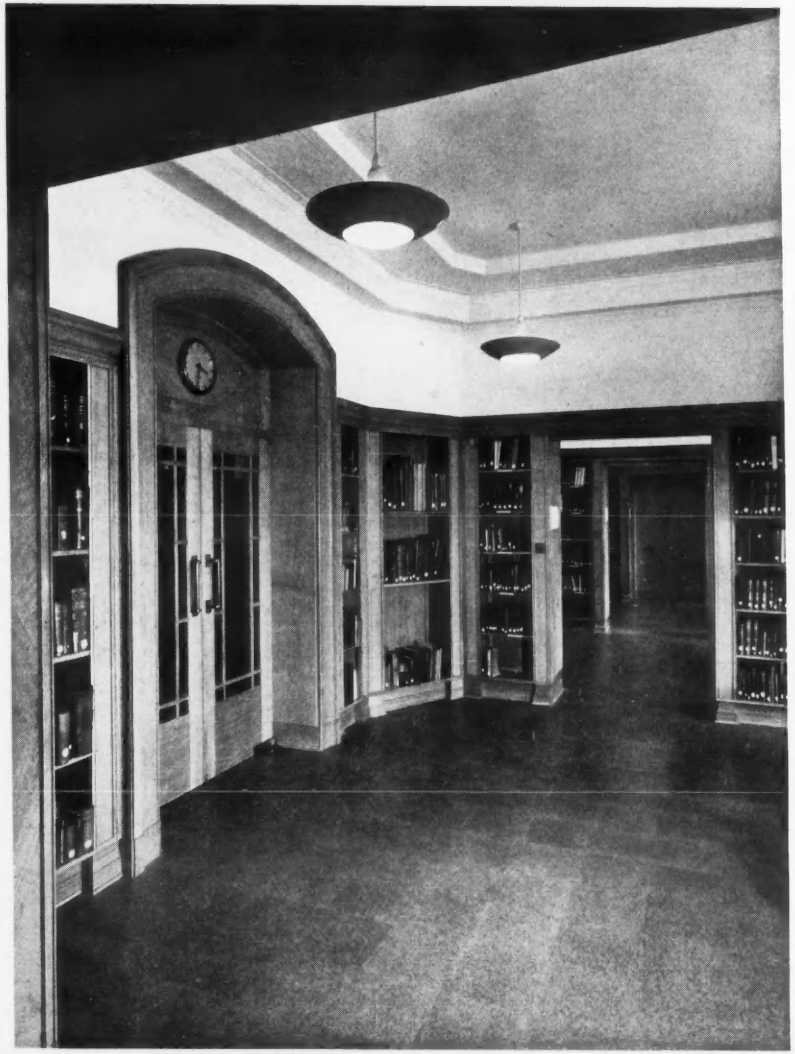
Heating, specialist plumbing and general plumbing, F. G. Alden, Ltd. ; panelled rooms in Empire timbers, flush doors and panelling, J. P. White and Sons, Ltd. ; bookcases, wall panelling, etc., in main library, Scott Morton, Ltd. ; wrought-iron balconies, balustrades, gates, etc., Birmingham Guild, Ltd. ; wood block flooring, A. M. McDougall and Son, Ltd. ; furniture, Heal's Contracts and Webber's (Oxford), Ltd. ; sanitary fittings, Shanks and Co., Ltd. ; plumbing, cast leadwork and cast-iron sheets, F. Church ; reconstructed stone stairs, balcony, etc., Empire Stone Co., Ltd. ; York stone copings, pavings, etc., S. Marshall and Sons, Ltd. ; carving, D. Tegetmeir and Cribb ; electric lift, Waygood-Otis, Ltd. ; metal windows, doors and lantern lights, Henry Hope and Sons, Ltd. ; marble work, J. and H. Patteson, Ltd. ; dome roof lights, Pilkington Bros., Ltd. ; glazing, H. Hunter and Co. ; wall tiling, partitions and terrazzo work, Conways, Ltd. ; rubber flooring, Leyland and Birmingham Rubber Co., Ltd. ; blinds, J. Avery and Co. ; lightning conductor, J. Faulkner and Sons, Ltd. ; electric installation, Lowe and Oliver, Ltd. ; ironmongery, Laidlaw and Thomson, Ltd. ; "Paxtile" ceilings, Newalls Insulation Co., Ltd. ; steel book stacks, Luxfer, Ltd. ; slate shelving, Wilkinson and Leng, Ltd. ; duct framing, etc., Starkie Gardner, Ltd. ; cork flooring, Mundet Cork Products, Ltd. ; Granwood flooring, Granwood Flooring Co., Ltd. ; glass shelving, Pearce and Cutler, Ltd. ; and fire fighting appliances, Nu-Swift, Ltd.



General view of exterior, from South Parks-road

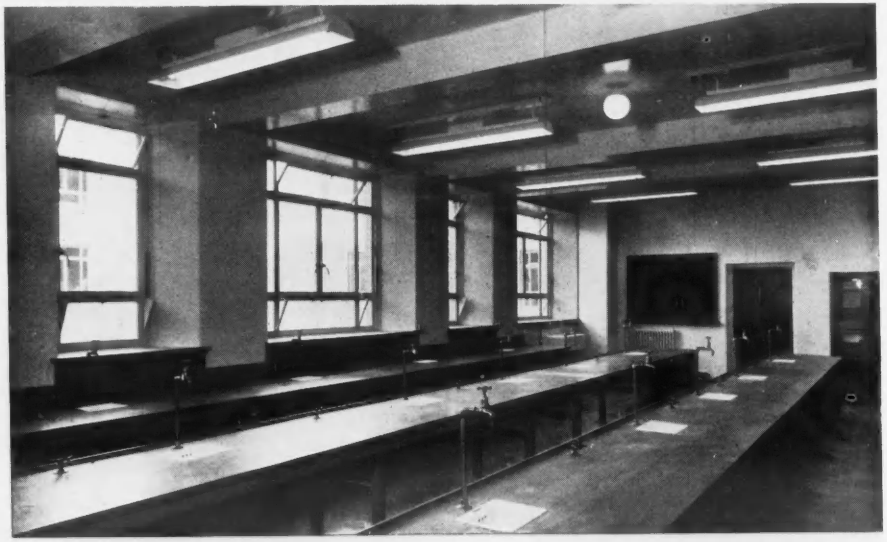
Photographs by Thomas-Photos

Library, in Scottish oak

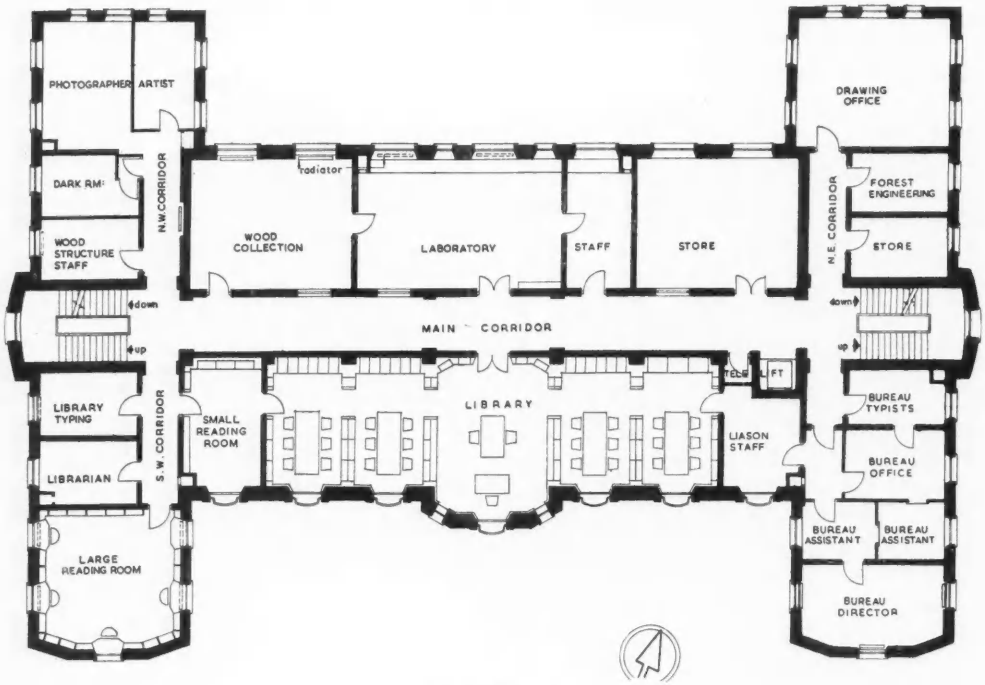


Central portion of the library

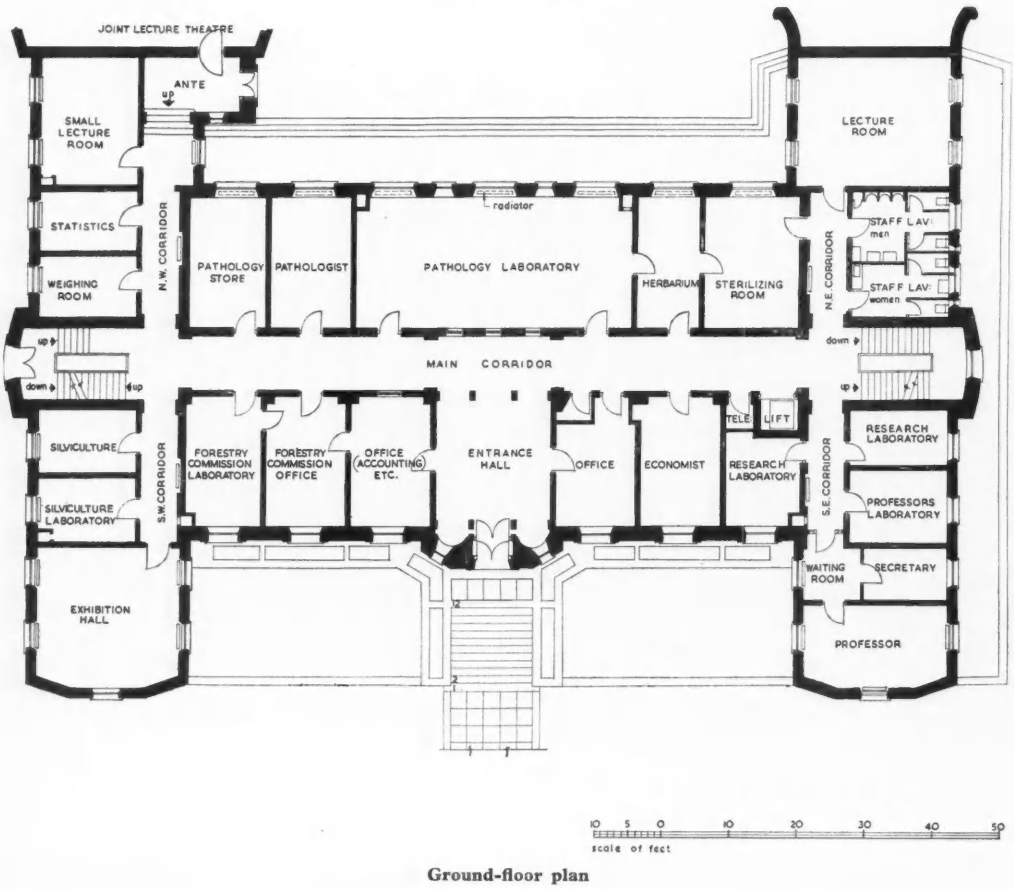
Large lecture theatre, panelled in Western red cedar



Top : **Panelling in entrance hall.** *Below :* **Pathology laboratory, in Burma teak**



First-floor plan



Ground-floor plan

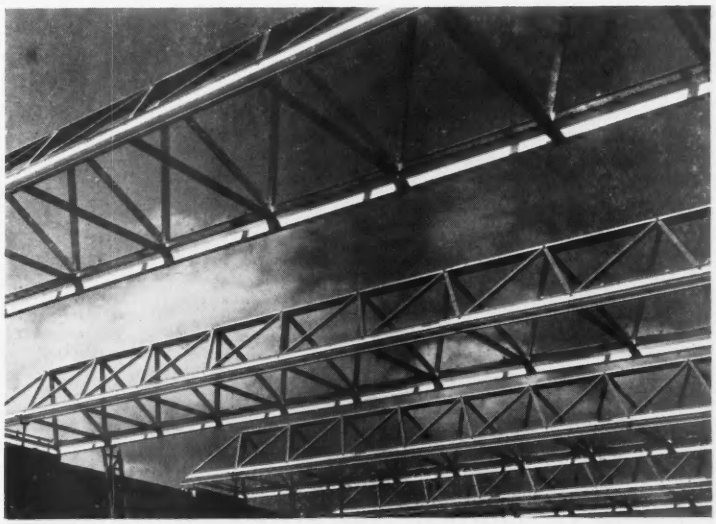
Western staircase, with fir-tree emblems in wrought iron

Entrance hall, panelled in Canadian yellow pine

Staff meeting-room, in English oak

IMPERIAL FORESTRY INSTITUTE, OXFORD : Staff room, in Avodiré from Gold Coast

FACTORY at Duxford, Cambridge

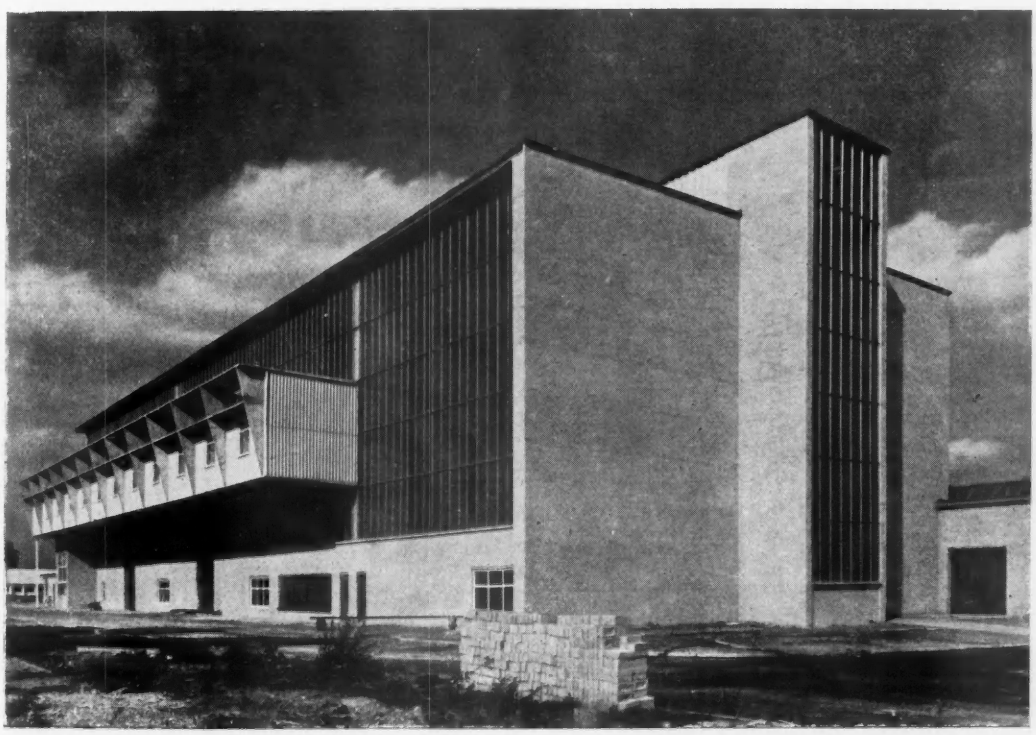


Aluminium roof trusses as erected

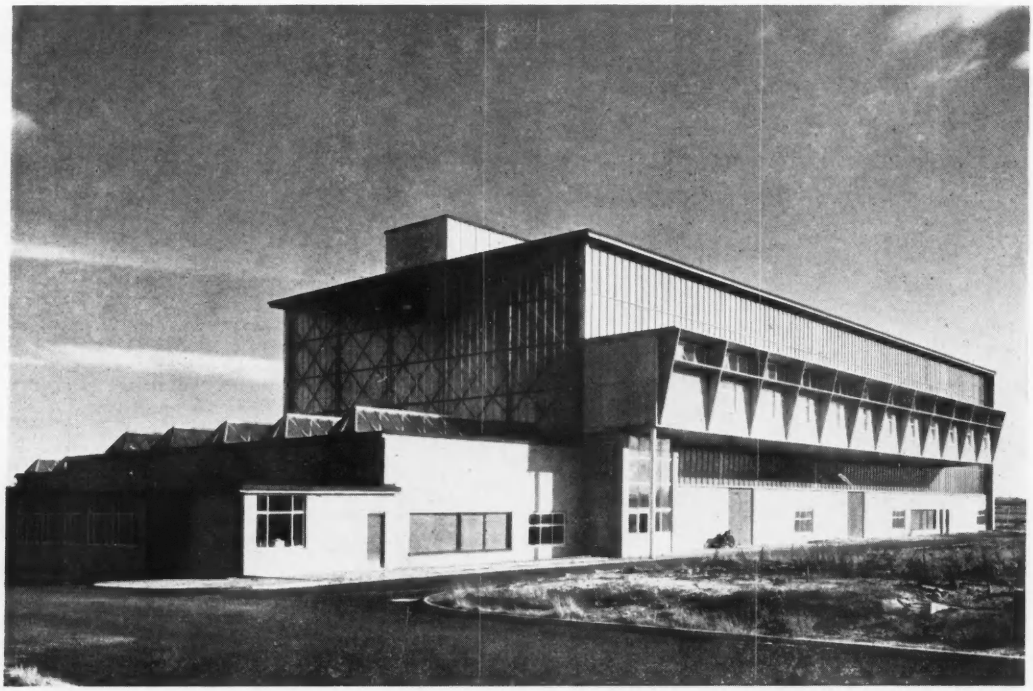
DESIGNED BY OVE ARUP AND PARTNERS : BARBARA PRIESTLEY, A.R.I.B.A., ASSISTANT ARCHITECT : I. L. HOLMES, A.M.Inst.C.E., SITE ENGINEER

THIS new factory and ancillary buildings for Aero Research, Ltd., are to accommodate a large extension to existing works. The present buildings were required to fit into an overall scheme in which each block could be fed by both railway sidings and roads. It was decided to split up the site into blocks of 300 ft. widths, and the slope to the river Cam is such that this dimension gives a 3 ft. 6 in. loading platform at the lower part of the block and a floor level flush with the road at the top of the block.

Design : The new factory consists of a production area with a floor to ceiling height of 50 ft., and a stores area with a height of 17 ft. In the main structure of the production area full use has been made of the main dividing cross walls. These have been framed in light steelwork for their full



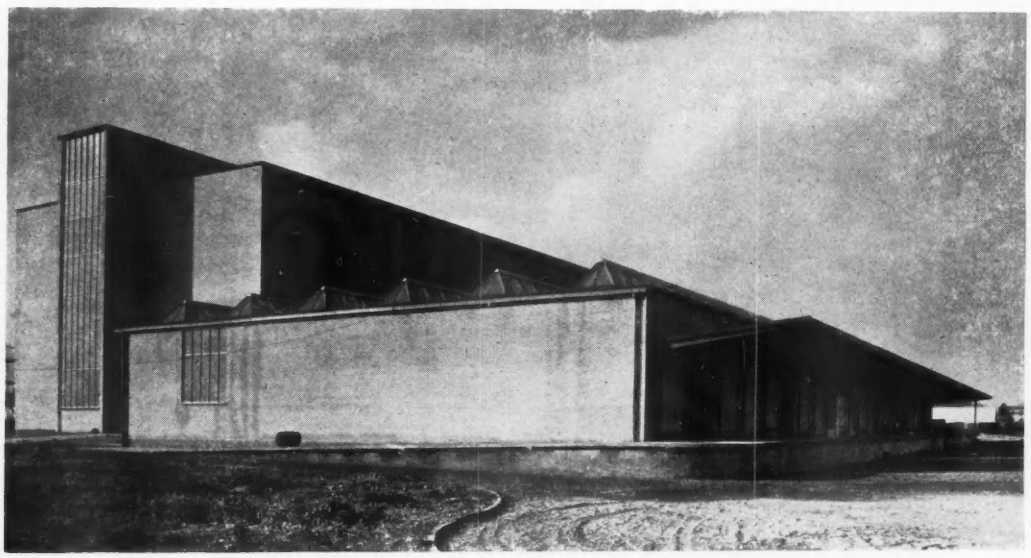
Process block and projecting laboratories and offices, from south



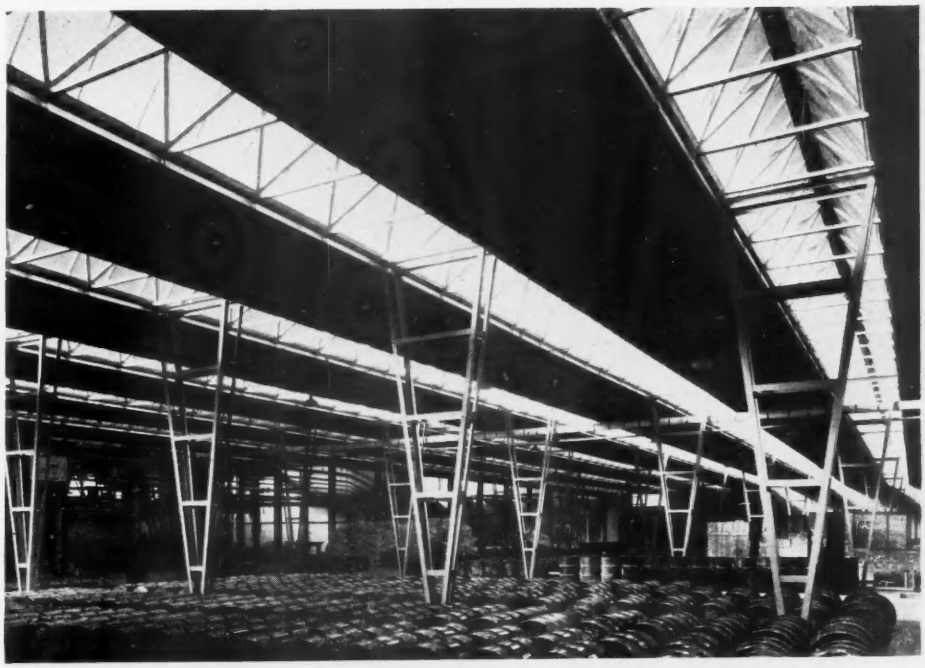
Process block, drum area, workshop and washrooms, from south

50-ft. height and clad with two skins of 4½-in. brickwork, leaving a 15-in. cavity. Spanning across the tops of these walls for the length of the building is a " spine " girder—a system of trusses—which not only supports the 10-in. by 4½-in. roof beams but takes the horizontal wind loads on the upper part of the building. The walls of the main production area are almost entirely of glass. The steel columns supporting them and the outer parts of the roof span the full 50 ft. height, their horizontal reactions at roof level being absorbed by the " spine " girder. On the stores side the columns are 15-in. by 6-in. R.S.J.s. On the other side the columns support also the inner half of the laboratories and are only 8 in. by 5 in., as the floor and roof of the laboratories act as horizontal beams and relieve the columns of part of the wind load. The outer edge of the laboratories is carried by a steel girder which spans across cantilevers framed out from the heavy main cross walls. Windows are fitted in between the bracing, and light asbestos cement cladding lined with 3 in. of cork forms the outer wall.

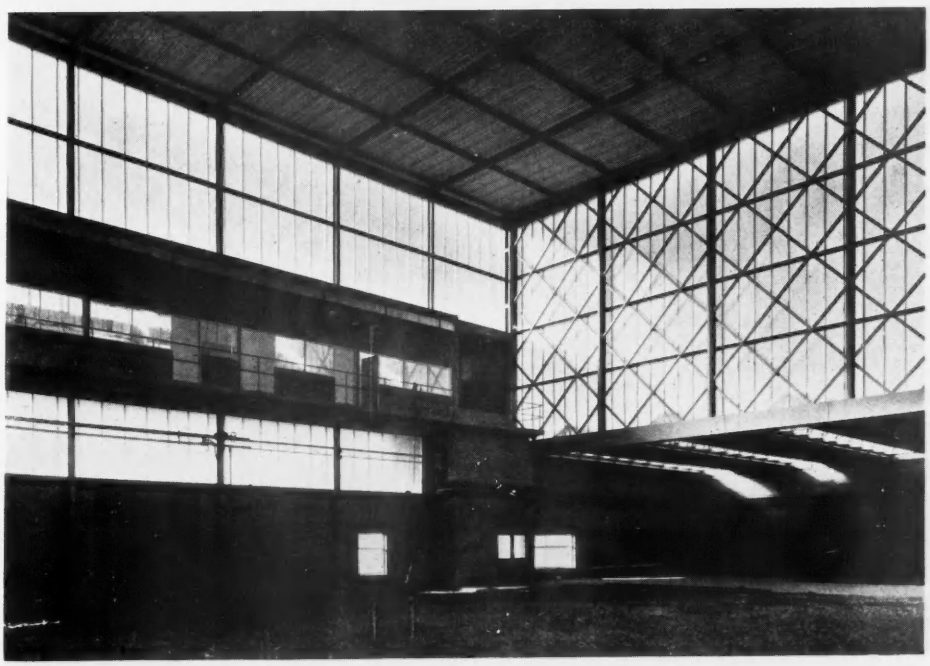
Both end walls of the building are structurally important. The south wall has two vertical fins of latticed steel covered with brick skins which give longitudinal stability to the whole building. Between the fins is a panel of patent glazing. At the north end an unobstructed floor for the whole width of 75 ft. was required up to the level of the stores roof. To take both the vertical and horizontal reactions from the



Stores and loading platform (in foreground), from south



Stores interior, showing finished roof, using aluminium trusses

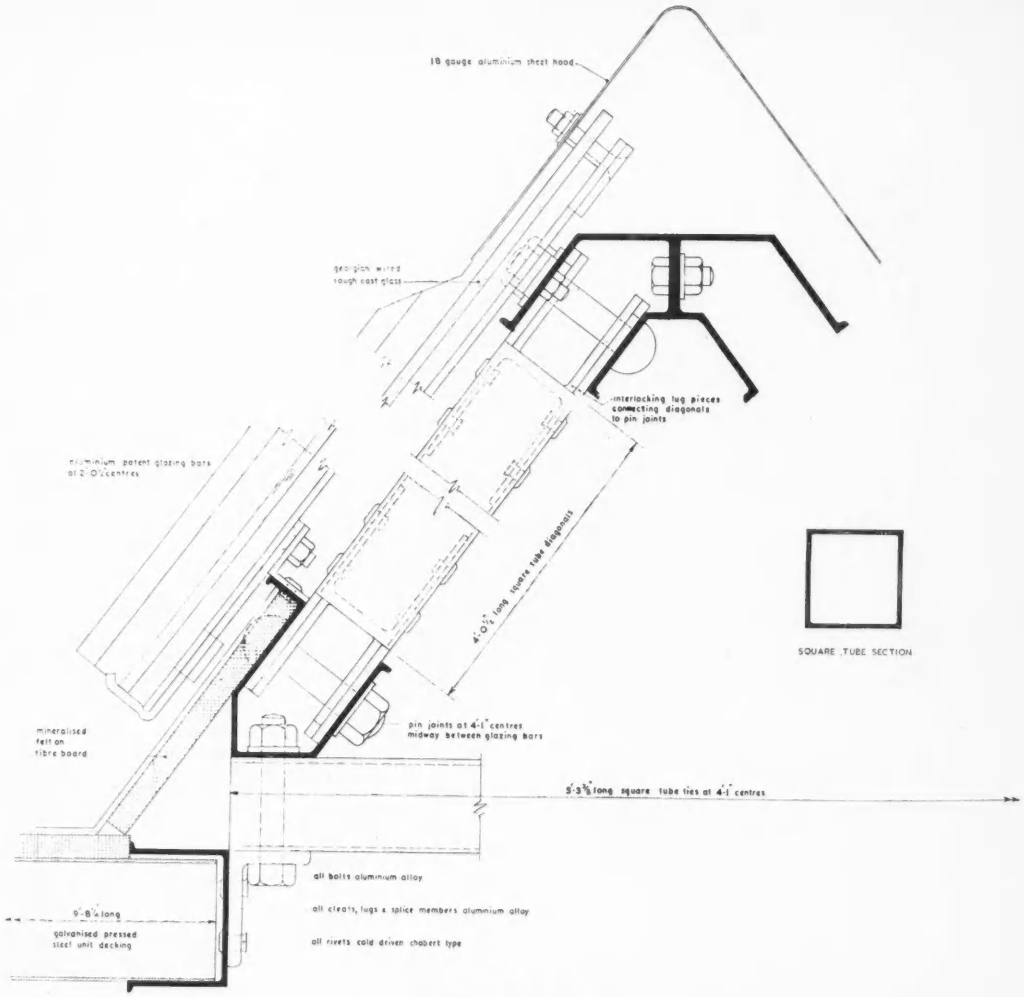


Process 3 area, showing clear span and access balcony to offices and laboratories

"spine" girder the whole of the end wall above the 17-ft. roof was designed as a deep lattice girder, the lattice members being 3 in. square tubes made from 3-in. by 1½-in. channels welded together.

The patent glazing is made from extruded aluminium bars at 2 ft. 0½ in. centres with ¼-in. Georgian wire roughcast glass and supported on horizontal 4-in. by 4-in. angles at 7 ft. 6 in. centres. The lower parts of the walls are of 11-in. cavity brickwork and accommodate doors, windows, drum hatches and other openings.

Stores Area: This is divided into incoming raw materials and outgoing processed resins. The area is laid out using the palette size of the run-about stacker as a module. The stores are divided into compartments of 42 ft. span by rows of V-shape steel columns so that the compartments can, if necessary, be fenced off with steel mesh fencing.

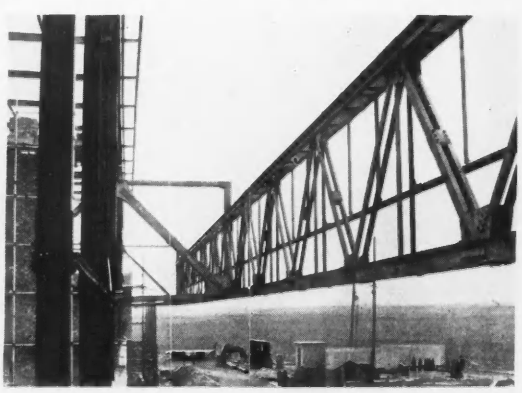

18 gauge aluminium sheet hood
georgian wired rough cast glass
interlocking lug pieces connecting diagonals to pin joints
aluminium patent glazing bars at 2'-0½" centres
4'-0½" long square tube diagonals
SQUARE TUBE SECTION
mineralised felt on fibre board
pin joints at 4'-1" centres midway between glazing bars
5'-3⅝" long square tube ties at 4'-1" centres
all bolts aluminium alloy
all cleats, lugs & splice members aluminium alloy
all rivets cold driven chobert type
9'-8¼" long
galvanised pressed steel unit decking

Details of roof construction

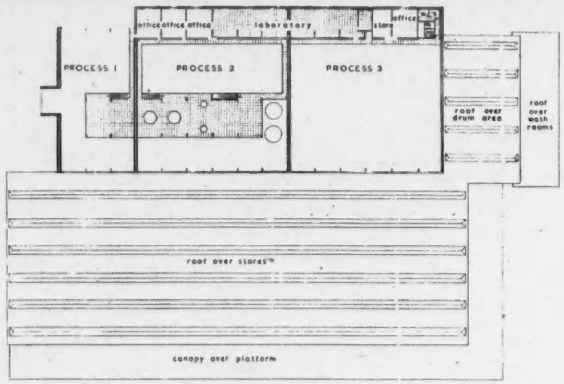
The quantity surveyors were Messrs. Davis, Belfield and Everest. Main contractors were: Roads, foundations and services Messrs. William Sindall, of Cambridge; structural steel and aluminium, English Bridge and Structural Engineering Co., Ltd.; and buildings, Messrs. Gee, Walker and Slater, Ltd. Subsidiary works were carried out by Messrs. W. A. Dawson, Ltd., Luton, and Harding and Sons, of Duxford.

Sub-contractors were: patent glazing, British Challenge Glazing Co., Ltd.; steel windows, Williams and Williams, Ltd.; steel deck and roofing, Ruberoid Co., Ltd.; sanitary fittings, William E. Farrer, Ltd.; ironmongery, Dryad Metal Works, Ltd.; electrical work, Rashleigh, Phipps and Co., Ltd.; heating services, Sulzer Brothers, Ltd.; cell concrete, Celcon, Ltd.; cork lining, Alpine Insulation, Ltd.; sliding door gear, British Trolley Track Co., Ltd.; rubber flooring, L. Fishburn; handrailing and steel floors, Grill Floors, Ltd.; plastering, W. A. Telling, Ltd.; painting, Less (Shelford), Ltd.; Hollow tile roofs, Flooring Contracts (London), Ltd.; asbestos cement and building materials, Travis and Arnold, Ltd.; and quarry tile floors, A. H. Herbert Co., Ltd.

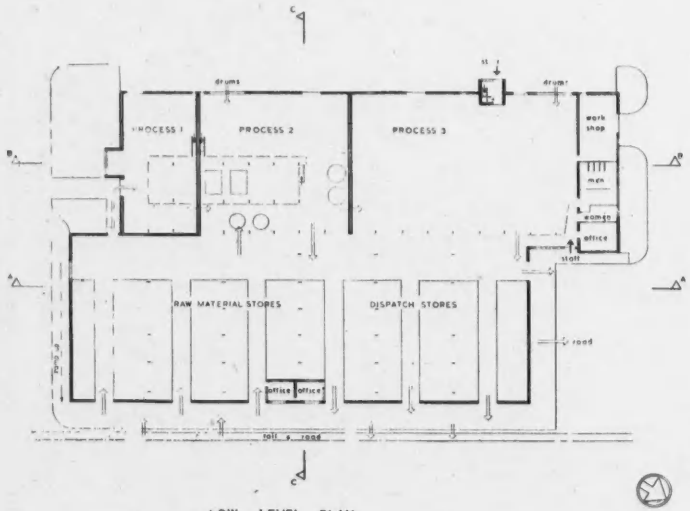
Detail of clear span deep lattice girder



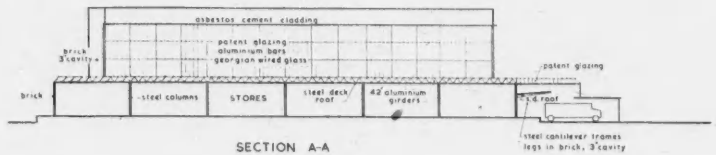
Cantilevered girder and columns supporting offices



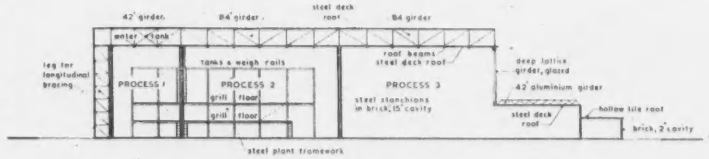
HIGH LEVEL PLAN



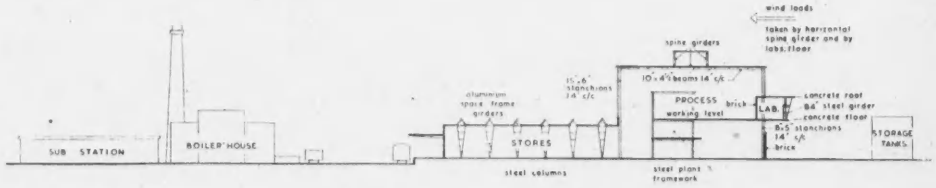
LOW LEVEL PLAN



SECTION A-A



SECTION B-B



SECTION C-C

SCALE: 20 10 0 20 40 60 80 100

FACTORY AT DUXFORD, CAMBRIDGE: Plans and sections

ARCHITECTURAL DRAUGHTSMANSHIP OF THE PAST

Mr. Goodhart-Rendel's Address to R.I.B.A.

"THAT kind of architectural draughtsmanship which I hold to be most important to the welfare of architecture—the draughtsmanship that shows the public what to expect in what is not yet built, and what to look for in it when it comes into being," formed the basis of the address given by Mr. H. S. GOODHART-RENDEL, M.A., P-P.R.I.B.A., before the Royal Institute of British Architects on Tuesday night, from which we give the following extracts. The President (Mr. Graham Henderson) was in the chair.

Mr. Goodhart-Rendel said:

I conceive architectural draughtsmanship to be the work done in his proper capacity by an architectural draughtsman, whether he be a pictorial artist or not. The proper capacity of an architectural draughtsman embraces the making of drawings of two kinds, those primarily meant to convey the architect's design, and those primarily meant to explain the methods proper for its execution. . . . Every architectural drawing other than a template, or a bench drawing at full size, is inevitably conventional. It shows a building not as anybody could ever see it, but in a manner from which its design can be deduced by those familiar with the convention adopted. Ground plans are obviously mere maps, showing the solids and voids in a building on certain levels at which it is supposed to be sliced through. Sections show where the solids and voids would appear if the slicing were done not horizontally but vertically. In elevations a building is represented as though the lens of the human eye were as broad as the drawing and could, therefore, be exactly opposite every part of it at once. Both in them and in drawings made by isometrical projection, nothing is supposed to diminish with distance, the parts of a building farthest from the eye being drawn no smaller than those nearest to it. This is partially rectified by the method of linear perspective, but even in this there is an arbitrary falsity. It is rectified horizontally but not vertically, the effects of distance from the eye in a vertical direction being entirely disregarded. In a drawing "set up in perspective" the figure of a man on the roof of a tall building covers exactly as much paper as the figure of one standing upon the pavement.

The perspective of the photographic lens, although very different from that of the human eye, is probably more like it than is the conventional perspective of modern draughtsmanship. So habituated, however, have our eyes become to this conventional perspective that photography, by means of various mechanical adjustments in cameras, has been brought to imitate it as nearly as possible. Indeed, since the Renaissance the convention of linear perspective has become what practically all adult Europeans believe that they see in Nature and demand to see in representations of Nature.

Linear perspective, therefore, is the method by means of which a design in architecture can be most intelligibly represented to persons not trained in the mysteries of the art, and is that most readily intelligible even by initiates. As with other precious things its value is implied in the extent of its abuse. Having unrivalled powers of truth-telling it can also magnificently lie. It is the honest architect's most candid and inconvenient friend: it is the dishonest architect's most artful and convenient confederate.

Of the nature of architectural draughtsmanship in the ages of Antiquity I believe I am right in saying that we have no information whatever. Concerning that in the middle ages we have a precious document in the sketchbook of Wilars de Honnecourt, and a good many scraps of tributary evidence in remains found, some quite recently, of workmen's diagrams drawn upon planks that have been used afterwards for other purposes. Wilars seems to have filled his sketchbook for his own eye alone, it is an excellent model of the *aide-memoire* a zealous architect will make of things seen upon his travels. From it we can infer (Fig. 1) what other evidence supports—that the mediæval draughtsman was no purist in his method, lapsing from the rigour of elevation into comfortably lawless perspective whenever such a lapse would make his point or tickle his fancy.

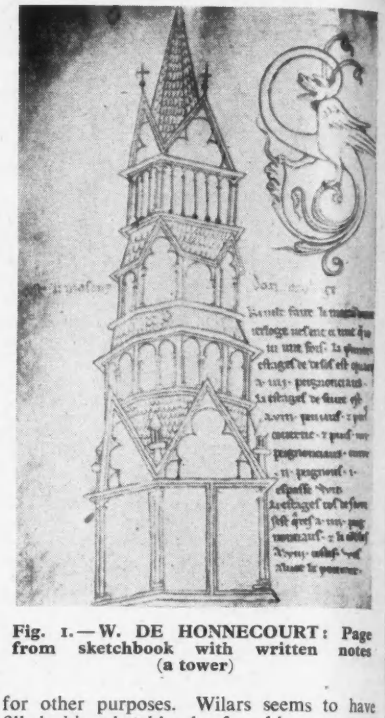


Fig. 1.—W. DE HONNECOURT: Page from sketchbook with written notes (a tower)

Mr. Goodhart-Rendel continued: Most of my time I shall spend in studying with you that kind of architectural draughtsmanship which I hold to be most important to the welfare of architecture, the draughtsmanship that shows the public what to expect in what is not yet built, and what to look for in it when it comes into being. This kind of draughtsmanship has nearly slipped into the past altogether, and I should be tempted to despair of what I believe to be its most necessary recovery if I did not remember that the past in which it flourished was not a long one. What has sprung up suddenly before may therefore spring up suddenly again.

Theory and Practice

I know that a great many people nowadays would contend that an architect's ideas are without interest until they have been proved by embodiment in actual buildings. All that this ridiculous contention denotes is that those who make it are interested in buildings and are not interested in ideas, indeed are probably impervious to them. The proper use of the æsthetic power of architecture is little less of a science than the proper use of the constructional power of engineering, and no engineer outside Bedlam would deny interest to theoretic projects that may not yet have been put into effect. The enormous predominance of mere news in architectural journalism to-day—and in the category "mere news" (usually untruthful news) I include practically all illustrations of buildings by photography—is a sad index to the apathy with which the exercise of imagination has come

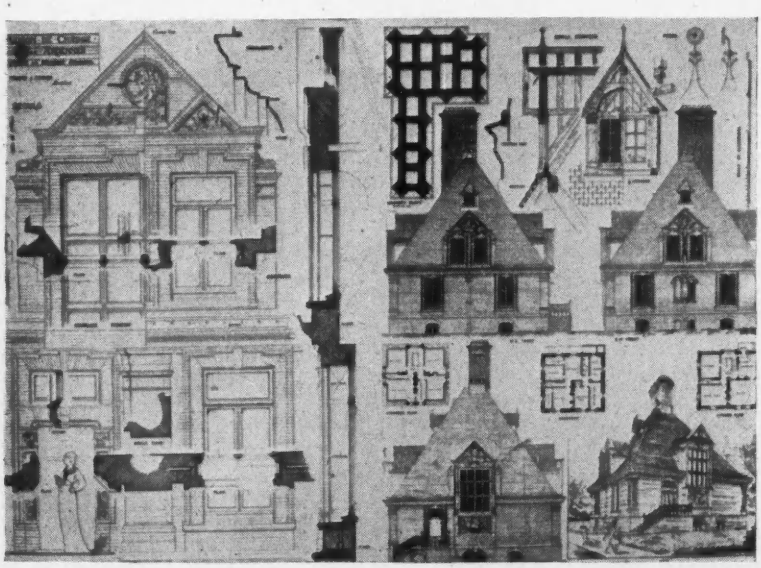


Fig. 2.—MAURICE B. ADAMS:—Maison de Chasse in the Ardennes ("Building News," Oct. 27, 1876)

to be regarded by the common run of architects. Fortunately students still have an appetite for unrealised projects, not only of their own but also at least those of Mr. Lloyd Wright. I am convinced that this interest architects who have lost it must recapture. Good architects must be students all their lives.

The Arrival of Lithography

Considering how great their cost inevitably was, it is surprising how many beautifully fine steel engravings were commissioned by enterprising publishers, but not at all surprising that they were included only in publications of an expensive kind. The arrival of lithography cheapened the cost of reproduction enormously, and bestowed upon the draughtsman the power of communicating directly with his public, a power of which many availed themselves. Nevertheless, even after photo-lithography had taken over nearly all the day-to-day business of the wood-engraver, and had shunted the steel engraver on to a side line of luxury trade, the established draughtsman did not always learn quickly the capacities, more limited then than now, of his new interpreter. Much that architectural journals wished to publish, therefore, still had to be redrawn, and in the *Building News* was redrawn most efficiently, by the then editor, Maurice Adams. The specimen of his work (Fig. 2) is not an example of popular

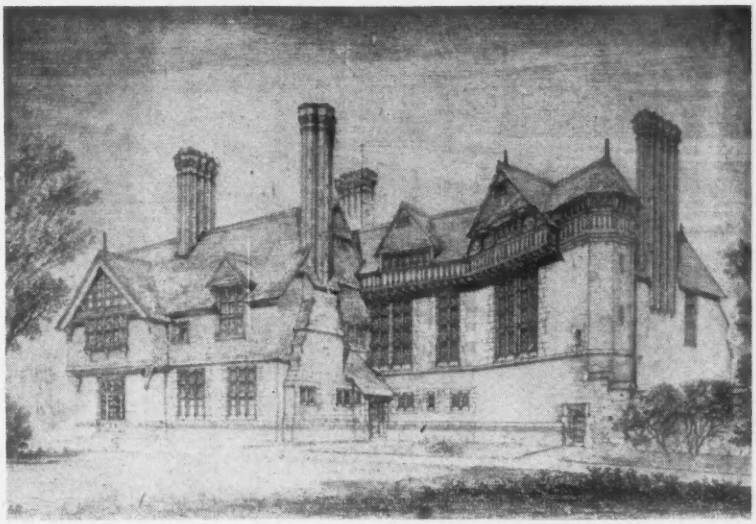


Fig. 3

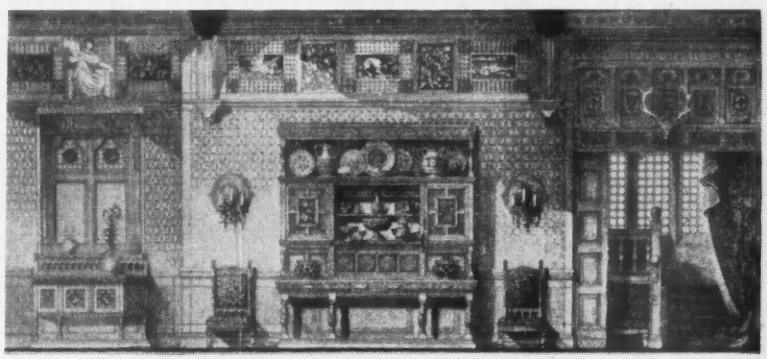


Fig. 4

Fig. 3.—NORMAN SHAW:—A perspective drawing of Graeme's Dyke (R.I.B.A. Collection)

Fig. 4.—BRUCE TALBERT:—Side elevation of dining-room. ("Examples of Ancient and Modern Furniture," by Bruce Talbert, 1876. Plate 44)

Fig. 5.—H. W. BREWER:—"Deserted" ("The Builder," Jan. 5, 1884.)

Fig. 6.—C. E. MALLOWS:—House near Upton-upon-Severn. ("The Builder," Oct. 13, 1888)

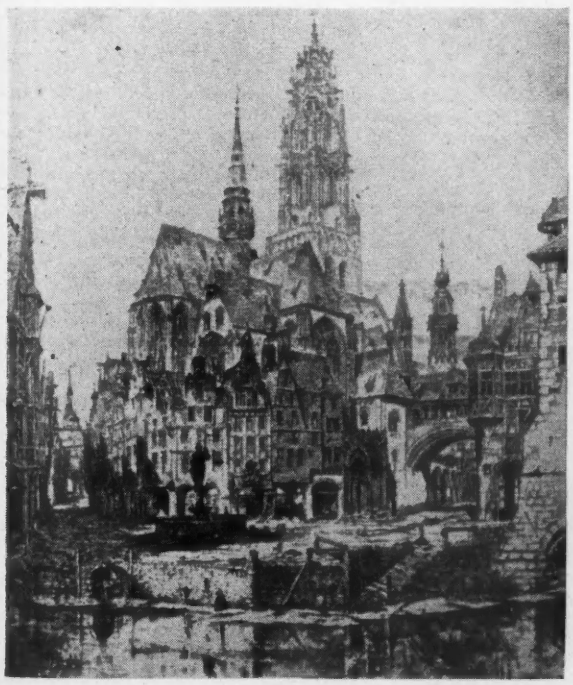


Fig. 5

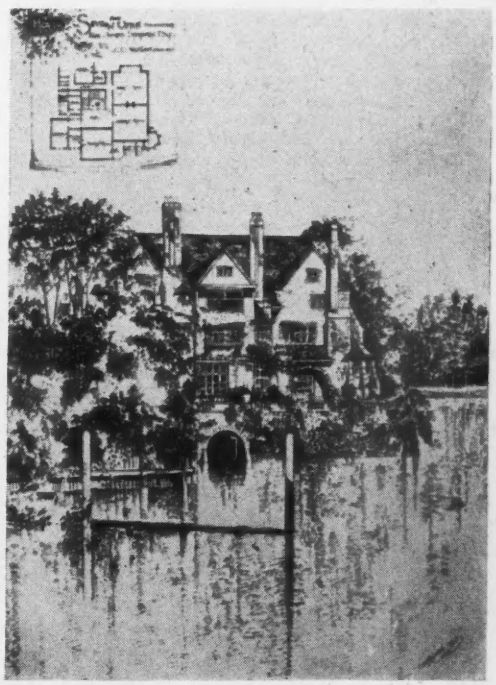


Fig. 6

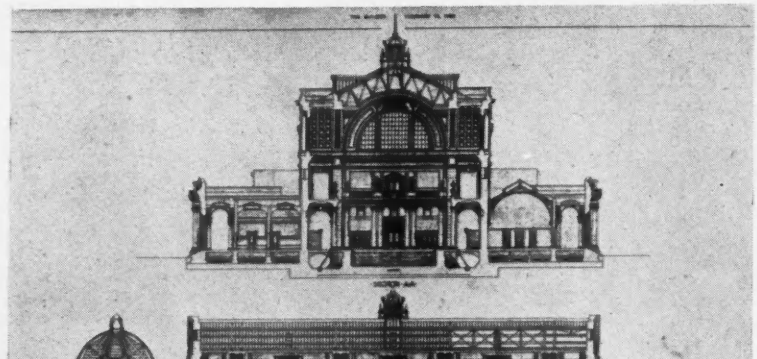


Fig. 7.—J. B. FULTON:—Design for a swimming bath, sections AA and BB. ("The Builder," Feb. 15, 1902)

illustration (in which his touch was less happy), but a drawing intended to show architects not necessarily what its subject *looked* like, but what it *was* like, philosophically and in essence. As such I do not see that it could be bettered.

After references to W. E. Nesfield, Frederick Deshon and George Edmund Street, the lecturer came to consideration of the "routine perspectives" that issued so numerously from the office of Street's great pupil, Norman Shaw. He said: The great merit of these, in my eyes, is that they *were* routine perspectives, clothing all the designs they illustrated in a uniform convention which makes them easy to judge and compare. There is in them little attempt to captivate, but a very thorough attempt to explain (Fig 3). There is no marked distinction between the office perspectives drawn by Shaw himself and those drawn in his method by his assistants, although on close examination personal peculiarities are discoverable. The drawing [shown on screen but not reproduced] was made for him by Lethaby in 1883, and seems to me a little tamer and more meticulous than if it had been by the master himself. It is, nevertheless, of great interest both intrinsic and as an example of drawing in pen and ink that derives less from etching than from wood-engraving.

By this time, the adoption by the Press of photo-lithographic reproduction had turned the small architectural room at the Royal Academy exhibitions into a black-and-white room almost entirely. Black and white, or sepia and white, that is to say—the brown line being generally preferred by draughtsmen who still used the pen in the manner of the etcher's needle. Architects who themselves were accomplished water-colourists continued to display their skill, but those who were accustomed to have their show drawings made by others obviously would choose for them a medium that allowed of direct reproduction in the architectural journals.

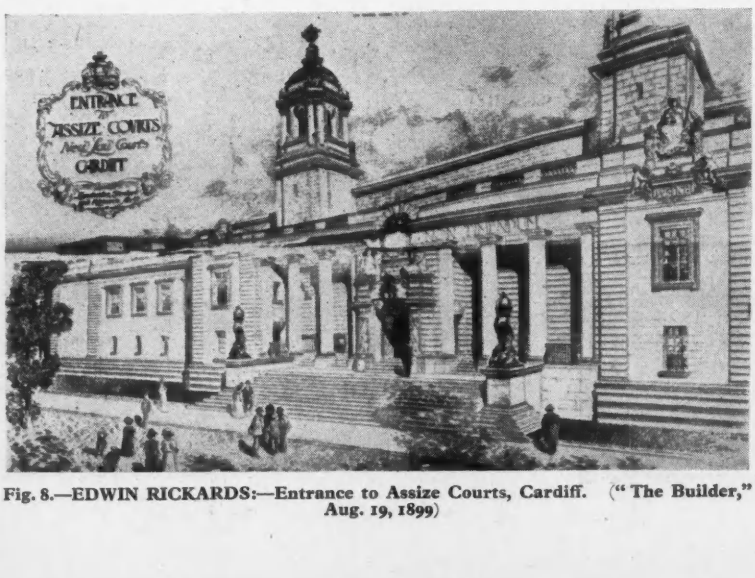


Fig. 8.—EDWIN RICKARDS:—Entrance to Assize Courts, Cardiff. ("The Builder," Aug. 19, 1899)

I think it is tenable that the first artists, of any kind, to develop a really new technique proper for photo-lithographic reproduction were architectural draughtsmen, but not architectural draughtsmen belonging to the schools from whose work my illustrations have so far been taken. The most brilliant specimen of this ideally photo-lithographic draughtsmanship that I could show you would probably be one of the designs for an imaginary drawing or dining room, about the size of the Drury-lane stage, with which Walter Hensman, an associate of Bruce Talbert's, used regularly to adorn the walls of the Royal Academy exhibition. Hensman's notions of decoration, however, might arouse in you such dismay that you would overlook the cleverness of his draughtsmanship. I have therefore chosen, instead, a page from one of Bruce Talbert's own books. This (Fig. 4) in a sense is a decorative drawing, itself it is a pattern made up of patterns.

H. W. Brewer

After showing slides of work by Edward Godwin and Herbert Gribble, the lecturer continued: Those whose opinion I respected when I was young, and respect still—perhaps also with a difference—used to tell me that the king of all picturesque architectural draughtsmen, past, present, or probable, was H. W. Brewer. Certainly his powers were extraordinary. Year after year *The Builder* would issue, as a Christmas present to its readers, some great fantasy of his, a panorama of medieval Paris, for example—or a recreation of a Hanseatic port with its every activity in full swing—or—but let me show you one of them, I think one of the best. The title of this drawing is *Deserted*, It shows (Fig. 5) a dump of the disused apparatus of medieval civilisation, an abandoned church, decaying houses, a grass-grown quay, everything with its former pride falling, falling, falling from it into dust. It shows also architectural beauty of a noble kind, proud beauty now humbled and become the unresisting food of decay. Not a bad showing for an architectural draughtsman to make in the New Year number of *The Builder* for 1884!

Brewer was a man of noble character, a man of phenomenal architectural learning, and in nature a poet. He was also a draughtsman of a very high order and, if internal evidence is to be trusted, something a great deal more than a mere assistant to more than one of the architects who enlisted his services. If he was not the king of his kind, he was very near the throne.

Brewer had begun to draw for *The Builder* when that journal was still illustrated only by the woodcut, his work suffering as much as would be expected in its translation into that medium. By the time at which the plate *Deserted* was published, photo-lithography was far enough developed to do it justice, and by that time also the half-tone block had arrived, making possible the cheap reproduction of drawings done in colour or in monochrome wash. These possibilities were first turned to advantage by *The Architect*, other more conservative journals continuing for a while to have brush drawings redrawn in line for reproduction in the older way.

The "Dazzle" Technique

As soon as photographic reproduction of black and white drawing had been brought to the point at which pretty well anything that could be drawn could be cheaply printed, an enormous amount of talent was

poured into it by artists of all countries, changing the whole scope and character of the art. The dazzle technique that it exemplifies seems to have come to England from America where it had blown over from France and Italy. As applied to architecture I think that perhaps its earliest practitioner was Martin Rico, but the name with which it was associated above all others in the minds of most people was that of Joseph Pennell. The specimen in Fig. 6 appeared in the *Building News* of 1888 and must have introduced most of the readers of that journal for the first time to the young perspective artist who was afterwards to attain such phenomenal popularity, C. E. Mallows. I am afraid that I think that all that was respectable in the work of Rico and Pennell was absent in his, and that his wonderful adroitness would have been better employed in almost any direction than that in which he turned it. However, the dazzle technique dazzled English architects very completely, every senior draughtsman practising its tricks with the hope of some day becoming another Mallows. No, not every senior draughtsman; some, I think, would sooner have become supernumerary Herbert Railtons. Railton, a brighter dazzler, and, incidentally, a much better artist than Mallows, found his chief employment in the book illustration for which the style in which he practised had originally been concocted. But when he did descend into the architectural arena to make a perspective drawing, the effect was terrific.

The Naughty Nineties

I think that in nothing were the nineties naughtier than in the irresponsibility of their fashions in architectural draughtsmanship. Dazzle technique was the most popular among these, being the easiest to imitate after a sort, although not, perhaps, to imitate successfully. A vogue was enjoyed, also, by a manner founded upon the conventions of early Renaissance engraving, a manner in which surfaces of all materials were given a steely sheen, in which flowers and bushes were drawn like patterns for wallpaper, and in which skies were filled with pillow-cases caught up on telegraph wires. My old friend and mentor, Beresford Pite, a magnificent draughtsman but a capricious one, had set this sort of thing going with the design for a club-house that won him the Soane Medallion in 1882.

Should it be true, as has been said, that architects for public works are selected under an aristocracy by snobbery, under a bureaucracy by jobbery, and under a democracy by competition, the Victorian age was one of democracy indeed. In almost every weekly issue of the professional journals some new open competition would be announced, and by means of such opportunities the upper rank of the profession was constantly replenished with new men and the national architecture with new notions. In the year 1902 the Soane Medallion was won by J. B. Fulton with a set of remarkable drawings for a swimming bath, drawings of a kind of which every participant in open competitions stood most in need. They were clear, rich, easily reproducible and in their mannerism wonderfully modish (see Fig. 7.) For some years afterwards (and, as a matter of fact, for a few years before), most competitions of any importance were strongly flavoured with Fulton, either authentic or derived. I remember, when I was about 17 years old,

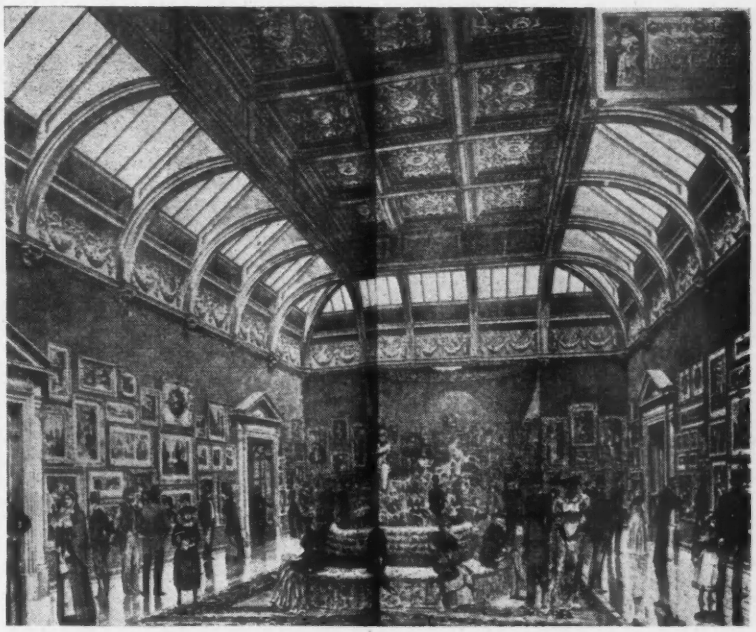


Fig. 9.—C. W. ENGLISH:—Grafton Galleries, Bond-street. ("Building News," May 5, 1893.) (This slide was reproduced from a creased page)

trying passionately to wriggle thick lines about in the Fulton way, but one wore different-shaped collars and coats in those days, used different slang, and still occasionally rode in hansom cabs.

Bravura in Black-and-White

For legitimate bravura in black-and-white drawing no renown has been better deserved than that of Edwin Rickards, of whose work I show you a specimen (Fig. 8), made when he was on the threshold of his subsequent fame, a view of part of the Law Courts he built at Cardiff. Throughout all the period we have been traversing, Ernest George was building and drawing without pause, recordings each of his works in pictorial renderings that expressed perfectly, but with great economy of means, the fundamental architectural idea behind each design. His personal technique of line and wash in sepia looks the easiest in the world and yet has baffled all its would-be imitators.

Once their architectural practices were established, the services as draughtsman of Pite, Rickards, George and Nicholson naturally were no longer available to other people; but in those artists who made architectural draughtsmanship their sole vocation there were names scarcely less notable. I do not think proper justice has yet been done to the memory of one who, in his day, was the best known of them all, C. W. English. I show you his repre-

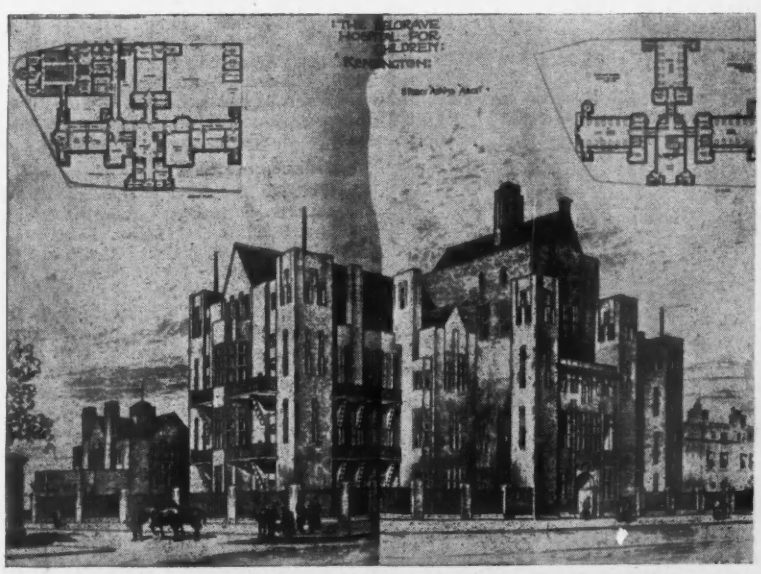


Fig. 10.—RAFFLES DAVISON:—Belgrave Hospital, Kennington. ("Building News," Aug. 10, 1900.) (This slide also was made from a creased original)

sentation of a top-lighted picture-gallery, full of people with black faces such as we see at the Royal Academy (Fig. 9). If he was required not to commit the architect any further than was necessary in a preliminary design, he was no less fascinatingly skilful.

Sir Charles Nicholson, who was not greatly interested in drawings made by specialists of the work of other people, always made an exception in favour of those made by Alexander McGibbon. Sir John Burnet, whose views I also absorbed with a reverence that time has only increased, chose McGibbon to make many drawings for him.

I should not be surprised if in number the output of Raffles Davison in drawings exceeded that of any architectural draughtsman in history. He was an architectural enthusiast, always on the look out for the works of young (and I am afraid often immature) men to encourage by publication in the paper *The British Architect* which was largely illustrated by his own hand. He published a design of mine when I was fifteen years old, so no wonder that I regard his memory with tenderness! He could draw extremely well, and often did. He also sometimes drew less well. He developed a convention that allowed him to draw quickly, sometimes with an admirable fluency only so to be obtained, but sometimes too quickly. When his subject had strong character, he conveyed that in a drawing that would be one of his best. One of these I have chosen as my last slide this evening. It represents Dr. Holden's famous hospital at Kennington (Fig. 10). I think you will admit that little of the poetry of the building is lost in Davison's drawing.

NOTES AND NEWS

An Annual Necessity

PROFESSOR W. G. HOLFORD'S Christmas talk "The Growth of a Town" at the R.I.B.A. was notable for the fact that, although primarily intended for children and "teen-agers," the subject matter was so adroitly presented that it was of great interest to adults as well.

This particular R.I.B.A. function has always been a success, and the large, appreciative audiences which it attracts suggest that it is an event which is tremendously worth while. The spoken word, aided by well-chosen slides, is still a most effective method of teaching. The personality of the speaker may be such that new vistas are opened up for the listeners who, if they were reading instead of listening, would not react so eagerly.

In listening to Professor Holford's clever exposition on the growth of and reason for our towns, the young audience was rapt, and we suspect that in not many years from now a considerable proportion of that audience may be aspiring members of the architectural profession.

Colonial Office Project

REFERRING to the proposal to erect a new Colonial Office on the site of the old Westminster Hospital, LORD MANCROFT, M.B.E., speaking at the annual dinner and dance of the London and Home Counties branch of the Incorporated Association of Architects and Surveyors held at the Park-lane Hotel, Piccadilly, on January 8, said that apparently the public had agreed to what he described as "this desecration in the heart of the British Empire."

No other nation, he suggested, would allow such a proposal to be carried out in their own country. It was the custom in Britain to realise the effect of architectural projects far too late. We only started to make a fuss about a doubtful scheme after it had been built.

The effect of the new Colonial Office building, if it were erected on the hospital site, he continued, would be such that it would dwarf Westminster Abbey and wreck the view of the Central Hall. Lord Mancroft criticised also the published proposals for the rehabilitation of Carlton House-terrace on the grounds that they too would tend to spoil the existing architectural scene there.

L.C.C. Proposals for Lambeth Site

THE CONSTRUCTION of the temporary roundabout at the intersection of Waterloo-road and York-road, Lambeth, will leave surplus to immediate requirements an area of land part of which will also be surplus to requirement when eventually the permanent improvement is undertaken. On this site, which presents a commercial frontage to the new street being formed at this point, the London County Council propose to erect 16 lock-up shops and two kiosks. The land is adjacent to one of the most important approach routes to the Festival of Britain central exhibition on the South Bank and it is proposed that the shops and kiosks shall be erected in time for the opening of the exhibition. The shops will be in traditional construction, one storey in height, and the two kiosks have been designed to harmonise with them. The total cost of the works is estimated to be £26,645.

Architecture To-day

MR. MICHAEL WATERHOUSE, M.C., P-P.R.I.B.A., is to give two lectures on "Thoughts on Architecture To-day" at the University of London on February 8 and 15. The chairman at the first lecture will be Professor H. O. Corfiato, F.R.I.B.A., F.S.A., professor of architecture at the University.

Architect to Visit Jugoslavia

MR. ANTHONY M. CHITTY, M.A., F.R.I.B.A., A.M.T.P.I., is to visit Jugoslavia shortly as the guest of the Institute of Jugoslav Science and Culture. He will take films on building and planning technique and will lead discussions in Belgrade, Zagreb, Sarajevo and Ljubljana.

The Architecture of Transport

AN EXHIBITION entitled "The Architecture of Transport" is to be opened by the Right Hon. Lord Hurcomb, G.C.B., K.B.E., and will be on view at the Royal Institute of British Architects, 66, Portland-place, W.1, from February 22 to March 22 (weekdays 10-7, Saturdays 10-5). The exhibition will be divided into four main sections—Road, Rail, Water and Air—and will show by means of photographs, plans and models the architect's work in these fields. A large proportion of the exhibition will be devoted to projects in this country but there will also be an interesting selection of material from abroad.

Director, British Standards Institution

THE BRITISH STANDARDS INSTITUTION have appointed Mr. H. A. R. Binney, C.B., to be their new Director and Secretary in succession to the late Mr. Percy Good, C.B.E.

R.I.C.S. "Quiz" Meeting

THE NEXT MEETING of the Middlesex and Urban Essex branch of the R.I.C.S., to be held on January 15 at Beale's Restaurant, Holloway-road, London, N., will take the form of a "quiz," in which the junior members will ask questions which senior members will answer. All junior members who wish to put forward questions are asked to send them as soon as possible to Mr. R. E. Tinson, B.Sc., A.R.I.C.S., 12, Lonsdale-close, Orchard-drive, Stonegrove, Edgware.

T.P.I. Journal

IN THE current issue of the Journal of the Town Planning Institute, the first of a new volume, various changes of format appear. The overall size of the Journal is now 8½ in. wide by 11 in. deep approximately, and there are 28 pages of editorial matter in this particular issue, which contains a number of illustrations. The type is set two columns to the page, which permits a clear and dignified form of presentation. In future there will be 10 issues of the Journal a year instead of eight.

L.M.B.A. Secretary's Bereavement

THE SYMPATHY of his many friends in the building industry will go to the Secretary of the L.M.B.A. and Mrs. Stenning in the very sudden death of their eldest son, John Michael, aged 15½, which took place at his home in Esher on Monday afternoon.

Professional Announcement

MR. A. BEAUMONT OWLES, A.R.I.B.A., who has been associated with Mr. Herbert S. Bostock, L.R.I.B.A., for several years, has acquired his practice at Southall. In future the practice will be known as Bostock and Partners and will continue at Central Hall Buildings, Station Approach, Southall, Middlesex (Tel. Southall 3491/2), where he will be pleased to receive trade catalogues.

COMING EVENTS

Monday, January 15

R.I.C.S. (JUNIOR ORGANISATION).—Mock arbitration. 12, Great George-street, S.W.1. 6 p.m.

INSTITUTE OF QUANTITY SURVEYORS (LONDON BRANCH).—"Forms of Contract Compared," by Mr. G. E. Allcock, 98, Gloucester-place, London, W.1. 6.30 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Discussion on "Aesthetic Design in Transmission and Distributing Systems, including the Power Station." I.E.E., Savoy-place, London, W.C.2.

Tuesday, January 16

INSTITUTE OF FUEL.—"The Transport and Storage of Coal," by Mr. Lionel Locket. Institution of Mechanical Engineers, Storey's Gate, S.W.1. 5.30 p.m.

Wednesday, January 17

REINFORCED CONCRETE ASSOCIATION.—"Concrete Formwork," by Mr. C. Parry. 11, Upper Belgrave-street, S.W.1. 6 p.m.

INSTITUTION OF STRUCTURAL ENGINEERS (NORTHERN COUNTIES BRANCH).—Joint meeting with Northern A.A. to discuss "The Aesthetics of Structural Engineering." Neville Hall, Newcastle. 6.30 p.m.

ILLUMINATING ENGINEERING SOCIETY.—"Early Years of Illuminating Engineering in Great Britain," by Mr. J. W. T. Walsh. Royal Institution, Albemarle-street, W.1. 6 p.m.

Thursday, January 18

ILLUMINATING ENGINEERING SOCIETY (GLOUCESTER AND CHELTENHAM CENTRE).—"Lighting of Architecture," by Mr. G. Grenfell Baines. Cadena Cafe, High-street, Gloucester. 6.30 p.m.

SOCIETY OF CHEMICAL INDUSTRY (ROAD AND BUILDING MATERIALS GROUP).—Film show. 11, Upper Belgrave-street, S.W.1. 6 p.m.

Friday, January 19

INSTITUTE OF QUANTITY SURVEYORS (LONDON BRANCH).—Annual dinner. Comedy Restaurant, Panton-street, London, W.1. 6.30 p.m.

COUNTY TECHNICAL COLLEGE AND SCHOOL OF ART, GUILDFORD.—Annual prize-giving and exhibition of work by building students. Guildford House, High-street, Guildford. 7.30 p.m.

FROM "THE BUILDER" OF 1851

Saturday, January 11, 1851.

THE NEW BRIDGE AT BATTERSEA.—During the last few days from twenty to thirty men have been busily employed in sawing timber and preparing piles to sink in the river, preparatory to beginning operations for the erection of the proposed and long-talked-of suspension bridge between Chelsea and Battersea.

OUTLOOK FOR 1951

Following are messages from the Leaders of the Industry on the building prospects for 1951. Messages from Ministers of the Crown are on page 33

FROM THE PRESIDENT OF THE R.I.B.A.

I AM delighted to comply with your request to send a New Year message to the readers of *The Builder*. First of all, in my other capacity as President of the Architects' Benevolent Society, may I express my gratitude to the members of the architectural profession who have already so generously supported the Centenary Appeal, and plead with those who have not yet written their cheques to do so and to make them as large as possible.

It is difficult to look to the future without a feeling of anxiety, since none of us knows how the international situation may develop. This is a matter which we as individuals can do very little to influence. In the faith that we can secure more settled conditions and the prospect of a lasting peace, then I am sure there is a busy future in store for the industry. The lessons which have been put before us in the reports of the Working Party and the Anglo-American Productivity Team are being very carefully studied by the Royal Institute and we are in close touch with our colleagues, the master builders and the quantity surveyors. The problem of architectural training is being carefully considered to see what more can be done to ensure that a candidate is better qualified on the practical side before obtaining Associateship and registration.

The other question which has been brought very much to the fore in the two reports I have mentioned is that known as "pre-planning"; here again we at the Royal Institute are seeing what can be done to advise and guide our members to make them more efficient in this respect, though it is appreciated by all of us that many of our troubles are due to the difficulties of obtaining the right sort of building materials at the right time and the tendency of the client—whether he be a private client or a public authority—to change his mind too frequently.

Hard work and the spirit of initiative are virtues which are called for to-day more than ever before, and if we can develop these and use them to the full I have no doubt at all that the building industry will fully justify itself and refute its many critics.

In conclusion, may I express to all your readers my best wishes for 1951 and the years to come.

A. GRAHAM HENDERSON

FROM THE CHAIRMAN, THE QUANTITY SURVEYORS' COMMITTEE, R.I.C.S.

TWELVE months ago we hoped that the year now ended would see at least a partial unshackling of the building industry from its wartime controls. Our hopes, alas, have not been realised; rather have they receded with the worsening of international relations and the advent of a rearmament programme which is certain to affect adversely the supply of building materials.

The industry and its allied professions are, undoubtedly, well aware of the need for greater efficiency and higher productivity, and the publication of the reports of the Building Industry Working Party and of the Anglo-American Productivity Team has aroused widespread interest. Bonusing, as an incentive for greater productivity and as a means of reducing cost, is being increasingly tried with success. More thought than ever is being given to education and training in the industry; this applies not only to apprentices but also and especially to means of raising intellectual and technical standards in the supervisory and managerial grades.

The difficulties which still face the industry are numerous, but realistic measures to meet them should be of great benefit in time to come. Relaxation of controls and a freer hand for the purchase of materials should find the industry ready and armed for the attack upon the vast arrears of work which remain to be overtaken.

L. E. HENDERSON

FROM THE PRESIDENT, I.A.A.S.

ONCE again I very gladly avail myself of the hospitality of your columns to offer to all your readers my good wishes for 1951.

The New Year opens under conditions of international tension and uncertainty, but to speculate on the effects of these would not, I believe, be profitable. Our duty, as it seems to me, is to press ahead with work in hand and to seek to make ourselves and our industry as efficient as possible in the continuing difficult circumstances. During 1950 much was published on the subject of the efficiency of the industry—I refer in particular to the report of the Working Party and the conclusions of the Team that reported on building methods in the U.S.A. What I would like to see happen in 1951 is that practical application should be given to such of the recommendations contained in these reports as are practicable under present conditions.

It is to my mind a great pity that there is no single body, really representative of all sections of the building industry, to which questions of this kind could be referred, and from whom authoritative decisions could be obtained. Housing remains the hard core of our building problem, and an increase in house production is an indispensable condition of the resumption of general building which is so necessary, not only to British architecture but to the achievement of maximum efficiency in the industry. I would like to see a statement issued on behalf of the whole industry, and authoritatively subscribed to by all sections, containing considered proposals for substantially increasing the rate of house building and setting out the prerequisite conditions of such an increase.

Few would dispute the need for a measure of building controls; but fewer still, I think, would defend the existing system of their operation. The issue, for instance, of building licences in terms of the amount that may be expended is particularly irksome and difficult in these times of ever-fluctuating prices. I strongly support the view that licences should be issued in terms of the quantity of materials that may be used. The great trouble with present controls is that they are rigidly applied throughout the whole country irrespective of local conditions which are extremely variable. The Town and Country Planning Act is another control upon the workings of which a synoptic report is overdue.

If we succeed in 1951 in coming to grips with some of the problems I have indicated, I believe this will be a happier New Year for all who have at heart the welfare of the art of Architecture and the craft of Building.

CHAS. H. TAYLOR

FROM THE PRESIDENT OF THE N.F.B.T.E.

IT is almost as difficult to look ahead this year as it was twelve years ago. This is particularly disappointing at a time like the present when action is being taken by all concerned on the recommendations contained in the reports of the Working Party and of the Anglo-American Productivity Team to improve the efficiency of the industry and by increasing productivity to speed up the still gigantic task of providing every family with a real home to live in, up-to-date factories and offices in which to work, modern schools in which to learn and properly planned and equipped hospitals in which to receive medical treatment.

In 1951 we shall have to devote at any rate some of our efforts to works designed to prevent another world war, but, provided the international position does not deteriorate, it is certain that a large part

of the industry will carry on with peace-time tasks. In any case what everyone will expect from us is increased productivity. We must therefore speed up our efforts to streamline our industry.

We have experienced many difficulties—particularly those arising from shortages of timber, bricks and cement—during 1950, and we shall no doubt meet many more before 1951 is out. These will be all the more readily overcome if all of us from those engaged in management downwards are better trained ; if we improve our methods by better planning beforehand, and better organisation on the site ; if more of us take a part in the great experiment of bonusing which was begun more than three years ago ; and if, above all, each and every one of us works harder. Only by so doing can we retain our present standards of living, and only in this way can we keep faith with the millions who are waiting for the buildings yet to be erected.

The Team from the industry which visited the United States was made up of representatives of the professions, of the sub-contractors, of the contractors and of the operatives. They worked together as a team, as I, who was privileged to lead them, know full well. My wish for the New Year, which will, I am sure, be shared by all readers of *The Builder*, is that this team spirit should prevail on every building site throughout the country. If it does, we shall do a lot to make others happy and shall, come what may, have had a happy year ourselves.

With the dawn of the New Year and the second half of the twentieth century, we are all trying to look ahead just a little further than usual. Despite two world wars, there can be no doubt that the nation's standard of living accommodation has advanced steadily during the past 50 years. Given peace, modern techniques should enable us to improve these standards more rapidly in the half century ahead. None of us can gain any satisfaction from his work unless he has faith in the future. We in the building industry are encouraged by a proud record of centuries to face the future with confidence. There is uncertainty to-day but, as in the past, this should make us more eager to grapple with the problems which confront us.

In my Christmas message to the industry, I referred to it as a large army. We are an army, but it is as individuals that we really count. We are not a regimented herd, but a vast number of free individuals by whose collective efforts the amount of progress we achieve will be determined. With the country in its present state, we, as a key industry, have an important role to fill. Difficulties there undoubtedly are for each one of us in his own sphere.

Let us pledge ourselves to help each other and by our common effort to make the greatest contribution possible to the well-being of the community. In this way 1951 can be the happy year I wish every reader of *The Builder*.

ROBERT O. LLOYD

FROM THE GENERAL SECRETARY, N.F.B.T.O.

I AM glad again to have the opportunity of expressing, through these columns of *The Builder*, my best wishes to the readers of this journal and of expressing also the fervent hope that peace, however uneasy it may appear, will continue to reign throughout 1951 in order that the building industry may proceed with its constructive tasks.

It is true that war conditions give impetus to certain kinds of building activity, but I feel confident that it is the desire of everyone, at least of every responsible person, that peace should continue, for the operatives, on whose behalf alone I am entitled to speak, desire nothing more than the opportunity to fulfil their important and constructive mission, which is to provide houses and other urgently needed buildings for the country. There is an anxious time ahead—perhaps not so far ahead—and one can but hope most earnestly that the statesmen of the world will keep their heads—in more than one sense of the term.

Capital cuts in civil expenditure usually fall initially on the building industry. While so much reconstruction work is requiring attention, I feel that these cuts are false economy, for the work has to be done at *some* time, and it is only by a consistent and regular programme that it can be done. Chopping and changing do no good to anyone. Full employment not only benefits the operatives themselves but the country as a whole, especially in these days when there is so much to do in the way of building houses, schools, power stations, factories, and so on.

There is no reason why the industry should not continue its peaceful pursuits in the negotiative field. At present there are matters before the Joint Council ready for detailed negotiation, and I have no doubt this will proceed in the customary atmosphere of mutual understanding and toleration.

R. COPPOCK

FROM THE CHAIRMAN OF THE BUILDING APPRENTICESHIP AND TRAINING COUNCIL

MANY of the difficulties which have beset the building industry during the last few years are still unsolved, but the industry can face the New Year with hope and confidence, relying upon its greatest asset, the good will and understanding existing between employers and operatives.

Recruitment and training of apprentices for the building industry is the main concern of the Building Apprenticeship and Training Council, and once more it is necessary to emphasise its vital importance. Apprentices supply the lifeblood of the industry and its health and vigour depend upon an adequate inflow of apprentices. The latest statistics show that the number recruited still falls below the target of 22,000 per annum fixed by the Council.

I now appeal to all concerned with recruitment and training for the building industry to tackle the problems ahead with boldness and vision. Apprenticeship in the industry not only leads to an assured livelihood but offers an occupation in which pride of craftsmanship and satisfaction in work accomplished provide a source of real happiness and enjoyment.

GEORGE GATER

FROM THE PRESIDENT OF THE FEDERATION OF ASSOCIATIONS OF SPECIALISTS AND SUB-CONTRACTORS

AT Christmas time it is natural for most people to let their minds dwell on the past, and, remembering alike past difficulties and past happiness, to count with thankfulness present blessings. The New Year, however, is an occasion for looking forward, for making plans and for resolving to make the best of our opportunities while soberly assessing the difficulties which may be encountered.

We have before us an even fuller programme than last year, for Defence expenditure has now to be reckoned with as well as the civil building programme. That is our opportunity, and we should resolve to show that we can meet it and win the success which we know to be within our powers. Conditions will not be easy and, as I write, there is great anxiety at the turn taken by the international position. That anxiety is being manifested, as in other ways, by large purchases in world markets of the materials necessary for Defence programmes, and the allocation to the same purpose of an increasing percentage of home-produced materials. Naturally this is already meaning that the needs of those who use those materials in the normal course of business are not being easily satisfied. Among these are, of course, the specialists of our Federation whose whole business existence depends on the availability of these supplies. To a lesser extent, the specialist's ability to cope with the 1951 programme depends on the availability of timber, cement and bricks, which are all important to the builder. Plans have been made to secure the requisite supplies, and it would not fit this occasion to take other than an optimistic view. Nevertheless, we all realise that the situation will want watching with the greatest care.

In conclusion, I send, particularly to members of my own Federation and in general to all your readers within and without the building industry, my most sincere hopes that 1951 will prove for them a prosperous and happy year.

DOUGLAS H. GREEN

R.I.B.A.

PRIZES AND STUDENTSHIPS, 1951

The Council's Deed of Award

AT a General Meeting of the Royal Institute of British Architects held on January 9, the Council's Deed of Award giving the results of the competitions for the annual prizes and studentships awarded by the R.I.B.A. was read. There were in all 683 competitors. The total value of the prizes and scholarships offered by the R.I.B.A. is over £3,000 a year.

The results of the various competitions are:—

The Tite Prize: A Certificate and £100 *for the study of Italian Architecture* (Subject: "An Arts Centre"). Winner: Ronald Leslie Marshall (Student R.I.B.A.), (Dept. of Architecture and Building, Southend-on-Sea Municipal College).

The Victory Scholarship and £120 *for the Advancement of Architectural Education* (Subject: "A Repertory Theatre"). Winner: Thomas Frederick Alston Manning, B.A. (Arch.) (Lond.), A.R.I.B.A. (Bartlett Sch. of Architecture, University of London).

The R.I.B.A. Silver Medal for Measured Drawings and £75. Winner: Robert Stanley-Morgan, A.R.I.B.A. (Birmingham Sch. of Architecture). Cert. of Hon. Mention: Peter Edward Buttenshaw, Dip.Arch. (Birm.), A.R.I.B.A. (Birmingham Sch. of Architecture).

The Royal Institute Silver Medal and £50 *for an Essay.* Not awarded.

The Owen Jones Studentship: A Certificate and £100 *for the improvement and cultivation of knowledge of the successful application of colour as a means of architectural expression.* Winner: Maurice William Lee (Student R.I.B.A.), (Birmingham Sch. of Architecture).

The Banister Fletcher Silver Medal and £26 5*s. for the Study of History of Architecture* (Subject: "The Development of the Medieval Market Square and its Characteristic Buildings." Winner: David Plaistow Crease (Probationer R.I.B.A.) (Sch. of Architecture, University of Cambridge).

The Alfred Bossom Research Fellowships for Post Graduate Research. Winners: (1) Leslie Vivian Mitchell, Dip.Arch., A.M.T.P.I., A.R.I.B.A. (Sch. of Architecture, Polytechnic, Regent-street, London) (£175), (2) John Buckley Bickerdike, Dip.Arch. (Manchester), A.R.I.B.A. (Sch. of Architecture, University of Manchester) (£75).

The Athens Bursary: £125 *for study at the British School at Athens.* Winner: Jack Ransom Tolson, Dipl.Arch., Dipl., T.P. (Leeds), A.R.I.B.A. (Sch. of Architecture, Schools of Technology, Art and Commerce, Oxford).

The Rome Scholarship in Architecture, 1950. £375 per annum for two or three years' study and research at the British School at Rome. Offered by the R.I.B.A., and awarded by the Faculty of Architecture of the British School at Rome. Winner: Edward Carter (Student R.I.B.A.), (Sch. of Architecture, King's College, Newcastle-upon-Tyne).

The R.I.B.A. Silver Medal and £10 *in Books for Students of Schools of Architecture recognised for exemption from the Final Examination.* Awarded to: Frank Shaw, Dipl.Arch. (Leeds), A.R.I.B.A. (Leeds Sch. of Architecture).

The R.I.B.A. Bronze Medal and £10 *in Books for Students of Schools of Architecture recognised for Exemption from the Intermediate Examination.* Awarded to: Frederick Anthony Sargeant (Student R.I.B.A.), (Dept. of Architecture, Northern Polytechnic, London). Cert. of Hon. Mention awarded to: Lionel Lowden Ferguson (Student R.I.B.A.), (Sch. of Architecture, Dundee College of Art).

The Archibald Dawnay Scholarships, 1950. *Three Scholarships of* £60 *each for the Advanced Study of Construction.* Awarded to: (1) Kevin Francis Craig-McFeely (Student R.I.B.A.), (Liverpool Sch. of Architecture, University of Liverpool), (2) John Burton Crowther (Student R.I.B.A.) (Welsh Sch. of Architecture), (3) William Gilbey Reed (Student R.I.B.A.) (Liverpool Sch. of Architecture, University of Liverpool).

The R.I.B.A. Henry Jarvis Studentship at the School of Architecture, the Architectural Association, 1950. £50. Awarded to: Denys James Hinton (Student R.I.B.A.).

The R.I.B.A. Howard Colls Travelling Studentship at the Architectural Association 1950, £15 15*s.* Awarded to: Robin Paul Younger.

The R.I.B.A. Donaldson Medal at the Bartlett School of Architecture, University of London, 1950. Awarded to: Michael James Peto (Student R.I.B.A.).

The R.I.B.A. Prize for Art Schools and Technical Institutions with Facilities for the Instruction of Intending Architects (£10 *in Books*), 1950. Awarded to: Charles Edgar Mason (Student R.I.B.A.), (Wolverhampton Sch. of Art and Crafts).

The R.I.B.A. Prizes for Public and Secondary Schools. (a) Essays. (1) £2 2s. to David Mackay, of Douai School, Woolhampton, for his essay on the Parish Church of Grouville, Jersey, (2) £2 2s. to Ian C. Thornton, of Manchester Grammar School, for his essay on the Rochdale Town Hall. *(b) Sketches.* (1) £2 2s. to E. F. Hull, of Northampton Grammar School, for his drawings of All Saints Church, Brixworth, Northants, (2) £2 2s. to Brian W. Riley, of the Grammar School, Batley, for his drawings of Shibden Hall, Halifax, (3) £2 2s. to M. J. Tysee, of Northampton Grammar School, for his drawings of All Saints Church, Brixworth, Northants.

The competition drawings (with certain exceptions) are on exhibition at the R.I.B.A., 66, Portland-place, London, W.1, until February 6.

The president, Mr. A. Graham Henderson, A.R.S.A., will present the medals and prizes and will deliver an address to students at 66, Portland-place, London, W.1, on Tuesday, February 6, at 6 p.m., and a criticism will be given by Mr. R. E. Enthoven, F.R.I.B.A., of the work submitted.

RESIGNATIONS.—The following resignations were accepted with regret:—Ronald McConnal Butler (F), Humphry Deane (F), Charles Frederick William Dening (F), Sir Charles Reed Peers (F), James Scott Glass (A) and Wallace George Mitchener (L).

CORRESPONDENCE

Carlton House-terrace

TO THE EDITOR OF *The Builder*

SIR,—I see in your issue of January 5 that the proposals for rebuilding Carlton House-terrace are being challenged. It is worth noting that the view published in your issue of December 29 (p. 684) is illusory as the Duke of York's column is drawn about 30 per cent. larger than it actually is. According to the published proposals, those portions of the terrace which would be built up would be approximately equal in height to the column.

H. V. LANCHESTER.

49, Hallam-street, W.1.

Paying for Council Dwellings

TO THE EDITOR OF *The Builder*

SIR,—Referring to the article in your issue for December 29, page 701, is there any financial mystery about the financing of nationalised housing? Local authorities, with permission from the Ministry of Health, borrow money for the purpose from the Public Works Loans Board which merely transmits it from the Bank of England. The Bank, a nationalised affair, creates costless book credits for the purpose. Local authorities receive these book credits, subject to interest, for periods up to 60 years, as loans and on terms which mortgage their income from rates. Repayment of loans and interest is made by annuities. Three per cent. interest on these loans makes the eventual real price of a council house about double its first cost, the rate/taxpayer recovering only about half his payments, in gross rents received.

The Bank, as a private enterprise, financed the late war at a little over 1 per cent. interest and, because its share capital was very small compared with its volume of loans, paid 12 per cent. to its shareholders.

The only mystery is why a nationalised Bank with no private shareholders should now demand 3 per cent. interest on costless national credit used for a national purpose. Without such interest housing rents might be about economic, and compulsory charity from the rate/taxpayer would be unnecessary.

ARTHUR WELFORD.

Bromeswell Corner,
Woodbridge, Suffolk.

Employers' Representation on N.J.C.

TO THE EDITOR OF *The Builder*

SIR,—From the remarks of the N.F.B.T.E. upon Sir Harry Selley's observations (page 708 *The Builder*, December 29) are we to understand that they have a Government-sponsored monopoly to represent all building employers?

Our Socialist Government have not yet included the nationalisation of the industry in their programme. It ill becomes a section of the building industry to introduce Stalinised bulldozing methods in a "phoney" attempt to declare themselves fully representative of the building employers.

For some many years now it has been clear that the N.F.B.T.E. is but the voice of a section of the building trade employers. I hope 1951 will see a really representative body emerge so our vital industry can give of its best as a united industry.

PAUL WILLIAMS,
Chairman, Area 28, Federation of Master Builders.

Putney, S.W.15.

Wages of Apprentices

TO THE EDITOR OF *The Builder*

SIR,—At a recent meeting of the London Association of Builders' Foremen and C.O.W.s, and during a discussion on apprentices, the writer commented that, in his view, one of the main reasons for the shortage of new entrants into the trades was the working conditions compared with certain other industries, and the rates of wages offered for the early years of the term of indenture.

On the question of shortage of apprentices, the above statement was not entirely true, and the writer hastens to add that there are not many vacancies for the trades of bricklayer, carpenter and plumber, although the position is easier with regard to the trades of plasterer, painter and stonemason. This information obtained lately refutes the impression given in trade circles to the contrary; undoubtedly, those concerned will rectify the misunderstanding in due course.

However, the fact remains that the wages for apprentices could be improved, and it is no surprise that many parents, especially those who may be already working at a trade themselves, look elsewhere for their sons' future, bearing in mind also the hazards and risks associated with the multifarious building operations. It seems that parents must subsidise the industry for some four years by keeping their sons as apprentices and, while this may not be a great hardship to some parents, it does remain a grievous burden on others, particularly in the case where the boy is one of the first to go to work and there are other younger members of the family to maintain.

It is a common belief that the best craftsmen emanate from building trade families, who learn their craft working alongside a relative or one who takes a personal interest in their welfare; this method seldom fails to be anything else but advantageous to the apprentice, both in a psychological and physical sense.

An explanation often given for the justification of the rates of wages to apprentices is that he is "learning," and, therefore,

must pay some premium for the privilege. In a way, this might have been true of the past century, but is it true in the realistic world of to-day? A question that could be asked is: who gets the ultimate benefit of the apprentice in later years? To a degree, the individual, but also the industry and the community generally, because the industry in particular could not survive without the craftsmen. Surely, therefore, it is not too much to ask the industry to offer something better for the apprentice? The fact must be faced that in after years it is the craftsmen who are the first to suffer the bitter experience of trade slumps, as many of us know to our cost.

It would be interesting to know on what basis the powers-that-be worked out the rates of wages for apprentices. It could not have been on the cost-of-living because it is well known that a growing lad eats more, wears out more clothes than his elders, and of course requires allowances for social activities and other desirable occupations. How is it possible to assess a boy's worth to the trade in a percentage form? The existing method of fixing wages for apprentices is ambiguous and lacking in imagination. In the writer's view, the rates should be made up from a subsistence level, expenses for fares and tools—including, say, drawing instruments—and monetary grants for successful work in school such as passing tests and other examinations. The latter would encourage the keen lads to be keener, and the slower boys to emulate the brighter ones. There are some employers who follow a similar plan, but I do seriously suggest that the grants be incorporated into the agreement and not left to the vagaries of employers.

The apprentices in the building trade, however, are offered better wages than their colleagues in the electrical contracting industry; for some reason unknown to the writer, they value their apprentices much less. A comparison is that a third-year boy-carpenter would receive 1s. 6d. an hour, while a boy-electrician gets 9¾d. At the age of 20 there is a disparity of 7d. an hour. If any father wishes to apprentice his son to an electrician, he must be prepared to subsidise the electrical industry for a longer period than if his son became a carpenter or a bricklayer.

FATHER OF AN APPRENTICE.

Christmas Greetings

TO THE EDITOR OF *The Builder*

SIR,—Every year at this season one receives from various and sundry firms in the building trade a multitude of calendars and diaries of which, but for a very small number, it is quite impossible to make use. Only a very small proportion of these calendars exhibit attractiveness; most of them are hideously ugly.

This yearly inundation shows no sign of abatement, and without wishing to appear ungracious, may I put in a plea to those concerned to stop what must surely be a stupid waste of material and labour? If firms must send one something, why not an attractive Christmas card? This at least would have the merit of standing a greater chance of being kept for reference purposes. I have received one such card from a large firm in the Midlands, and I can say that I get a good deal of pleasure in the attractive and simple way this firm's card is always got up, and it always goes into my reference files.

J. HOWARD LEECH.

Ridgeway, Burford, Oxford.

A. A.

Entrance Examinations and Scholarships

THE Architectural Association School of Architecture Entrance Examination for admission to first year will be held on March 19 next, followed by interview on March 20, 21 or 22.

Scholarships, offered by the Council of the Architectural Association to students of British nationality, are: Leverhulme scholarship, value £200 p.a.; Minter open entrance scholarship, value £100 p.a.; Sir Walter Lawrence open entrance scholarship, value £100 p.a.; Metal Window scholarship, value £75 p.a.; or Natural Asphalte Council scholarship, value £50 p.a. Each is tenable for five years. The closing date for applications is March 1 next. All candidates, including those applying for scholarships, must take the entrance examination.

The Selection Board for admission to years other than first will be held on April 16 next, followed by interview on April 17, 18 or 19. A scholarship, value £50 p.a., tenable for two years and presented by the British Metal Window Manufacturers' Association, Ltd., is offered. Closing date for applications is April 1 next.

Full particulars, application forms, etc., may be obtained from the Principal, Architectural Association School of Architecture, 36, Bedford-square, London, W.C.1.

THE BUILDING INDUSTRY

Proposals for Higher Efficiency

THE Minister of Works has, over the past seven months, been holding discussions with his National Consultative Council on the steps to be taken to give effect to the recommendations of the Working Party on Building and the Anglo-American Productivity Team. The stage has now been reached at which action on the recommendations has either been taken or been put in hand by those concerned; and the present series of meetings with the Council to review progress is therefore completed. Outstanding points will be kept under review. Earlier progress was outlined in a Press statement issued by the Ministry of Works on July 26, 1950. The council last met on December 11 and the position now reached on the recommendations, including points covered in the July Press statement, is as follows:—

Incentives: Discussions between employers and operatives have been successfully concluded and details of a new agreement on incentives for England and Wales were publicly announced on December 15. This new agreement not only marks an important step forward towards the higher productivity in building which is essential to the national economy, but also bears witness to the determination of both sides of the building industry to grapple with the problem of increasing building productivity.

It should be possible to obtain more houses for the same amount of capital expenditure; it continues to be the policy of the Government to build as many houses as can be built within the money limit set by the capital investment programme and the available supplies of materials.

Controls

The allocation of structural steel is now free from control and modifications have been made in the Town and Country Planning controls. The building licensing control has also been modified so that the period within which licensed work must be started is not now limited to two months from the date of the licence.

Departmental responsibility for building programme: It has been decided that in present circumstances there is nothing to be gained by alteration of the programming arrangements.

Building research: Responsibility for sociological and economic research in building was transferred to the Department of Scientific and Industrial Research from April 1, 1950, and almost all aspects of building research are now concentrated in that Department. The responsibility for reviewing the research programme and for conveying the results of research to the industry remains with the Ministry of Works, operating through its Advisory Council on Building Research and Development on which the professions and the industry, together with the scientists, are fully represented. These arrangements for securing the association of the building industry with research have been established on what it is believed will prove a satisfactory basis.

Technical advice on building to Government Departments: It has been agreed in principle that the Ministry of Works should be responsible for providing technical information on building to Government Departments, in addition to disseminating technical information and the results of building research and development to the industry and professions.

Building bye-laws and standardisation of local authority forms: The Ministry of Health, the Ministry of Works, the industry and the professions have concluded their discussions about the operation of building bye-laws in England and Wales, and the industry and professions have expressed satisfaction with the principles upon which the Ministry of Health are conducting their review of the model bye-laws.

Following a meeting between the Ministry of Health and local authority organisations, a detailed examination is being made to determine how far greater standardisation can be secured in the forms of application for bye-law consent issued by local authorities in England and Wales. In Scotland, discussions about the operation of bye-laws and the standardisation of forms are about to begin between the employers and professional bodies.

Standard forms of contract: The Departments which had not adopted uniform practice carry out building work of a minor nature and negligible volume, but have been approached with a view to their adopting a standard form of contract and will do so wherever possible.

Registration in the plumbing and electrical trades: Proposals for the statutory registration of employers and operatives in the plumbing and electrical trades have been drawn up by certain organisations in the industry which are in favour of statutory registration. These proposals have been circulated to the other interested bodies for consideration and comment.

Costing, programming and progressing: Leaflets on costing and on programming and progressing, and a booklet on programming and progressing prepared by the Ministry of Works are about to be published. The booklet on costing under preparation by the National Federation of Building Trades Employers will, it is hoped, be published early in the New Year.

Mechanical aids: A large and successful

plant demonstration formed part of the Leeds Building Week in September. Two demonstrations of plant for building are planned for 1951. Plant manufacturers are participating in the British Industries Fair in 1951 on a substantial scale. The Ministry of Works has arranged with the British Electricity Authority a simpler procedure for meeting the cost of providing electrical power on building sites, which has been welcomed by the industry, in so far as it should ensure the earlier and greater use of electrical power on sites and thus facilitate the use of power-driven tools on building operations.

Higher Training for Management

The importance of improved training for management and for supervisory posts in the industry is fully recognised. The industry is eager to get highly qualified men and is pursuing methods of placing and training them. The Building Apprenticeship and Training Council is engaged in a review of the existing arrangements and as a first step has put in hand the collection and co-ordination of information about training for management and supervision, about the courses provided at universities and technical colleges and about the placing of holders of university and higher technical qualifications, with a view to making a comprehensive report.

Indenturing of apprentices: The two sides of the industry are considering whether there is a case for altering the present periods of apprenticeship.

Flexibility of craft training: There is already a measure of interchangeability between crafts, particularly in rural areas, but the industry does not consider that it is, in general, desirable to train boys in more than one craft during the apprenticeship period.

Professional training: The Royal Institute of British Architects regard the practical training of architects on the site and in site offices as most important and are working out a scheme for such training in consultation with both sides of the industry.

Pre-planning: The Royal Institute of British Architects and the National Federation of Building Trades Employers are taking measures jointly to impress upon building owners the importance of deciding their requirements at an early stage and of avoiding variations while the contract is in progress.

Management of building operations: The Practice Committee of the Royal Institute of British Architects have considered a suggestion that a programme chart might be included in contract documents, but concluded that while the greater use of programme charts was eminently desirable in the interests of efficient organisation, it would not be practicable or desirable to include them as part of the contract.

Professional status of quantity surveyors: The Royal Institution of Chartered Surveyors are discussing with the National Federation of Building Trades Employers the suggestion that the Institution rules should be modified so as to enable surveyors employed by contracting firms to achieve or maintain professional status.

American plumbing practice: A technical examination has been conducted of American practice in plumbing. A memorandum for publication in the trade and technical Press, setting out the main features of good plumbing practice and giving instruction on their application, is being prepared.

PRODUCTIVITY IN HOUSE BUILDING

Payment of Incentive Bonuses

THE payment of incentive bonuses appreciably lowers man-hours in house building, i.e., increases productivity, and also lowers total costs per house as well as labour costs.

This is one of the conclusions reached as a result of a survey of some 160 local authority housing sites comprising more than 3,000 three-bedroomed houses, now published as a special report in the Ministry of Works series of National Building Studies.* A summary of the Survey was published in March last, before the full Report could be made available. This final version differs in a number of points from the summary.

The Survey, using a technique of statistical analysis not hitherto employed in building studies, was carried out in 1949 from investigations made into building contracts during the period August, 1947-October, 1948. The average site had 20 houses. The areas sampled were in South Wales and Monmouthshire, and in the following regions:—North Midlands and Midlands, Eastern, London, Southern and South-Eastern, South-Western.

An incentive payment—average £30 per house—was made on half the sites. While the effect of different incentive schemes varied, on an average every £5 of bonus paid per house resulted in a saving of two per cent. in man-hours. Allowing for the cost of the bonus, this gives an average net saving of at least £2 in labour costs per £5 of bonus. The effect on total costs was even greater (average £5 per £5 of bonus) because incentives tended to reduce site costs by speeding up the work. Rough checks made on each site, the Report notes, gave no support to the suggestion that incentive payments are associated with inferior workmanship.

Another factor influencing productivity costs was the number of houses on the site. Man-hours were lower on large sites. On an average, for every additional 10 houses, man-hours fell by 2½ per cent. and labour costs were also reduced by 2½ per cent. The survey did not cover any contracts of more than 80 houses, however. There was found to be a consistent increase in general productivity during the period under review, probably due among other factors to the improvement of material and labour supplies. Subsequent investigations suggest that this general increase in productivity had continued up to 1949, though at a lower rate.

BUILDING IN 1951

A Call for Efficiency

Speaking to Central Area No. 5 of the L.M.B.A. on Tuesday, Mr. S. F. S. Hearder, Director of the National Federation of Building Trades Employers (deputising for Mr. Robert O. Lloyd, O.B.E., President of the National Federation, who is indisposed), said that "it was early yet to attempt any sort of accurate assessment of what was likely to be the full effects of the programme on the building industry, nor could it be said with certainty what part the industry may be called upon to play in it. Meantime," he added, "we must push on with the tasks immediately before us, for there is an enormous amount of work to be done, despite the steady progress made in 1950 in the face of frustrating difficulties. In this New Year we should all resolve to do our utmost to improve building efficiency throughout the country in every possible way. By making the fullest use of mechanical equipment, by exercising the most careful economy in materials, and by the introduction of incentives on those sites where they are not already operating, we shall not only be preparing for any tasks the industry may be called upon to undertake, but we shall also be making valuable strides forward towards our ever constant objective—increased productivity with resultant lower costs."

* "Productivity in House Building." National Building Studies Special Report, No. 18. Published for the Ministry of Works by H.M. Stationery Office, price 1s.

LOWER BUILDING COSTS

"Incentives the Key"

"THE steady rise in the prices of building materials and the recent jumps in the prices of ancillary items of building plant, such as vehicle tyres and industrial and motor lubricants, make it even more imperative that every possible effort is made to keep building costs down if we are to accomplish the tasks before us." This advice was given by Mr. S. F. S. Hearder (Director, N.F.B.T.E.) in a speech to Central Area No. 1 of the L.M.B.A. on January 10.

The experience gained so far in pursuing the policy of linking wages with output had shown (added Mr. Hearder) that on those sites where incentives schemes were being successfully operated they were having a distinct and beneficial effect on the final cost, as well as ensuring bigger wage packets for the operatives.

"Nobody who understands the complexity of the building industry," he continued, "doubts the difficulties involved in applying incentives schemes to some aspects of its work, but as a result of the settlement between the National Federations of Employers and Operatives, published on December 15 last, there is now the opportunity to exercise the full resources of both sides of the industry to overcome the problems encountered. I am sure that if building employers and operatives take full advantage, in the right spirit, of the machinery which this settlement affords, the industry will make considerable progress in achieving higher output and lower costs."

An Appointment

MR. P. V. MARCHANT, A.M.Inst.C.E., M.I.Mun.E., registered architect, has been appointed Borough Engineer and Surveyor and Architect, Wandsworth. He is 49, and holds the position of Borough Engineer and Surveyor to the Dover B.C.

Demolition of Old Buildings

DESPITE PROTESTS from local organisations and a group of councillors, Orpington Urban District Council has decided to demolish buildings, some parts of which were erected in the fifteenth or sixteenth century and others in the late sixteenth century. The buildings are in the grounds of Orpington Priory, a thirteenth-century building, now used for council staff. They were originally built as the Priory's stables but at one time served as a parish hall.

The high cost of repair and restoration (about £3,000) is the reason given for the council's decision. A suggestion by the county planning officer that the fine central archway be saved was rejected. The buildings were constructed of flint, brick, and oak framed walls with a tiled roof.

STREAMLINING THE QUANTITIES

2.—On Practical Proposals

By S. W. HOOKWAY, F.R.I.C.S.

HAVING discussed the points of principle it comes now to consider what practical proposals can be put forward towards streamlining the quantities. Such would fall under two main headings: (i) abbreviations making for crisper definition in the descriptive matter of the bill, and (ii) telescoping the method of measurement itself, by which is meant that the major items should draw to themselves and assimilate the minor items in the same trade or category. The first scarcely affects measurement at all: it is merely a question of cutting down the wordiness of the bill. Most surveyors fight shy of abbreviations in their bills, but if such were standardised and had authority by way of an appendix in the S.M.M., the disinclination to use them would be quickly overcome, with a resulting saving in time and bill space. Examples come quickly to mind: d.p.c., r.s.j., r.w.p., w.w.p., g.s.w. (drain), f.l. and b. (doors), k.p.s. and paint—and so forth; many polysyllabic words might be tail-shortened, as example, galvd., archtv., reinfcd., approx., waterpf., underpng., etc.; and a number of well-known collapsibles could be generally adopted, as example, rfc. for reinforced concrete, and xpml. for expanded metal lathing.

Despite the disfavour shown to abbreviations it is noteworthy that the all-purpose abbreviation *ditto* is universally accepted; if, therefore, it is objected that some confusion might result in the minds of less experienced estimators by the use of abbreviations one has only to point to the hard worked *ditto*, which indeed if not thoughtfully related to the phrasing of the item which goes before, can often be a trap for the less instructed. Here, however, as in every technical exposition, the conventions must be learned and accepted by those whose business it is to interpret them.

One appreciates also Mr. Forster's call for an accepted vocabulary of short typical wordings, such as the expressive one he instances—"backfilling." This follows the already accepted ellipsis of "formwork" to cover the erstwhile "stout close boarded centering and supports, etc." The customary first item in *Excavator* provides another example: "Excavate over site average 6 in. deep to remove turf and vegetable soil" could well be standardised as "6 in. oversite strip"; and the wordy rigmarole of drain trench excavation might well be systematically abbreviated to "Drain trenching — ft. deep and backfilling." The judicious use of headings is the stamp of a well laid out bill under present usage; add conventional crisp descriptions to this and we might take our first step in streamlining the quantities. The example which follows shows how the customary first trade, *Excavator*, might appear as compared with the present orthodox wording first given.

EXCAVATOR

PRESENT ORTHODOX BILLING

1	Sup.	Excavate oversite average 6 in. deep to remove turf and vegetable soil and get out.
2	Cu.	Excavate to reduce levels and get out.
3	,,	Excavate to form surface trenches commencing at existing ground level and going down not exceeding 5 ft. deep and throw out.
4	,,	Ditto exceeding 5 ft. but not exceeding 10 ft. deep and ditto.
5	Cu.	Excavate to form basement commencing at general formation level and going down not exceeding 5 ft. deep and throw out.
6	,,	Ditto exceeding 5 ft. but not exceeding 10 ft. deep and ditto.
7	,,	Excavate to basement trenches commencing at basement formation level (i.e., 9 ft. down) and going down an additional depth not exceeding 2 ft., and throw out.
8	,,	Return and fill in the best of the excavated material around foundations in layers not exceeding 6 in. thick well rammed and consolidated.
9	,,	Load up excavated material and wheel and deposit in spoil heaps where directed on the site.
10	,,	Load up surplus excavated material and cart away from the site to a tip to be found by the Contractor.
11	,,	Clean hard dry broken brick or stone rubble filled in in layers to make up levels each layer well rammed and consolidated.
12	,,	6 in. Bed of ditto spread, levelled and ditto.

STREAMLINING

1	Sup.	6 in. Oversite strip.
2	Cu.	Bulk excavation.
3	,,	Trenching 0–5 ft.
4	,,	Ditto 5-10 ft.
5	,,	Basement excavation 0-5 ft.
6	,,	Ditto 5-10 ft.
7	,,	Basement sub-trenching.
8	,,	Compacted backfilling.
9	,,	Spoiling.
10	,,	Surplus off site.
11	,,	Bulk compacted hardcore.
12	,,	6 in. spread of ditto.

One has only to turn over the pages of any orthodox bill to find examples where descriptions could be streamlined in like manner, provided always that the conventions were standardised. Nevertheless, it must be said that the subsequent trades do not, as a whole, lend themselves to succinct treatment with quite such facility as does *Excavator*.

Streamlining and the S.M.M.

All this, however, goes but a short way and touches only the fringe of the country into which the "root and branch" reformers would have us go, among whom we must number Mr. Forster. To shorten the taking-off factor and streamline the quantities in the ultimate sense we would have to take drastic measures with the S.M.M.; that is a question of high policy and, to reiterate the theme of the previous article, whilst the quantity surveyor can offer suggestions, it is the contractors and subcontractors whose consent matters. But to whatever extent we may consider abridgment, or the condensing of descriptive matter, streamlining the quantities cannot be seriously considered on the basis of rough measurement or inexact description. Once admit that and the science will go out of quantity surveying. The acceptance of a so-called standard of approximate measurement would react so surely against the contractor that there would be a prompt outcry for a return to the *status quo*. No! measurement must remain correct and description precise even if the conventions of measurement and descriptive matter are permitted to be adjusted within accepted formulas. Mr. Forster's dictum that "the bills need not be more accurate than the judgment of the estimator and the sufficiency of his costing data" is sound, but only up to a point: it presupposes that the judgment of the estimator will coincide with that of the quantity surveyor, and in this imperfect world who would bank on that?

The quest for a fresh approach inevitably starts from the Short Code and the plea to make it the basis of a new and shortened system for universal application. On the principle, perhaps, that the child is father to the man, the reformers plead that the Short Code, the child of the S.M.M., should be the pattern of the future S.M.M. In point of fact this is the soundest line that can be taken. When the Short Code was being discussed six years ago the present writer made in this newspaper an analysis of a typical orthodox priced bill for a small dwelling house with the object of demonstrating the relationship between various groups of measured items and their cost as a percentage of the whole. It was shown that out of a total of 434 items in the bill, 36 major items (i.e., 8 per cent. of the whole) covered 73 per cent. of the total value of the bill, and that out of the 398 items remaining *not one* represented in the cash column a value of more than one half of 1 per cent. of the bill total, the average being less than one-tenth of 1 per cent.

Thus there was a sound case for the Short Code as applied to small dwelling-houses, and this was so because in that limited sphere the dictum that the bills need not be more accurate than the judgment of the estimator, etc., can be appropriately applied. The labour factor does not vary appreciably between one type of house and another where traditional methods and standardised planning are observed, and hence, on the basis of experience, and with judicious costing, the inclusive labour factor appropriate to any given usage of materials can be assessed without undue risk in that limited category. It does not follow, however, that the same results would obtain in other and more complex or specialised types of construction.

Nevertheless, the expedients by which the Short Code was produced from the S.M.M. should be carefully reviewed, and with the experience derived from the use of the Short Code over the past five years some appreciable telescopement of measurement might be found worthy of general acceptance. The abandonment of many of the labour items in *Bricklayer* is an example that Mr. Forster has pointed out. A precedent in this regard may be remembered in the Third Edition of the S.M.M. when many of the superficial and running labours on dressed stonework were abandoned, and it was deemed sufficient to give only the cube of stone in various descriptive classifications. A further example, to which the Short Code gives us the pointer, would be roof timbering, where all roof timberwork, except trusses (i.e., S.M.M. Carpenter 6 (a) (5) (6) (7) and the plates, etc., appropriate) could be grouped into one cube as "timber in roofs."

Adjusted Approach to Measurement

There remains an adjusted approach to the technical convention of measurement itself, by which is meant such processes as the commuting of various labours by accepted and standardised accretions to the bulk items. This is a method adopted already by some slating and tiling subcontractors. Double eaves course is equated with 12 in. measured widths of slating, top course with 6 in., hip and valley cutting with 9 in., and so forth. Something on similar lines is to be seen in the Standard

Drain List where bends, junctions and other "oddments," as they are termed, are commuted as so many feet run of pipe. The same could be done with the bends, outlets, etc., of gutters and rain pipes. Again, in some systems of flat roofing it was at one time appropriate to add in the skirting as a superficial accretion to the flat measurement. There are numerous instances where this could be enlarged upon. In *Bricklayer*, for instance, various labours could be commuted as an increment to the brickwork. Labour beam filling, for example, might be taken as an extra course of brickwork. Similarly, chases of various classifications, corbel course, wedge and pin up, etc.: each could be measured as equivalent to so many courses of 1B. The usefulness of such conventions of adjusted measurement would have to be balanced against the real saving of time—which, from the quantity surveyor's point of view, is not nearly so much as it might appear to be. Taking the example of *Slating* given above, the taker-off has still the same dimensions to put down, and the worker-up has quite as much abstracting and reducing to do to arrive at the commuted figure as he would require for the precise bill. Only the bill is shortened—whether it has thereby been "streamlined" or just emasculated depends upon the point of view.

One important outcome of these proposals would unquestionably be the revival of the Specification as a contract document, and in many respects the quantity surveyor would welcome this, provided always that it was a specification provided for him. The specification would contain the architect's full descriptions of all works, materials and labours, so that complaint of "shorts" in the bills could not be substantiated. There would, of course, be a greater responsibility on the contractor to examine the drawings —not the often perfunctory "sight of the drawings," which indeed many contractors deem to be unnecessary when in possession of an orthodox bill of quantities. It would almost be a necessity to have an endorsement slip attached to the working drawings from which the quantities were prepared, to be signed by each contractor tendering, to some such effect as "We have examined the drawings and we have satisfied ourselves on all matters deriving therefrom as related to descriptions contained in the bill of quantities."

Advantages and Disadvantages

Such, then, are some of the lines of approach and a few possible practical proposals towards streamlining the quantities. It remains to consider whether the advantages would or would not be outweighed by the losses; the frank expression of opinion encouraged by this journal can be a valuable contribution to this end, and it would not be fitting if the present writer failed to declare his own point of view. It has, in fact, already been expressed above. It is that we must have a great care not to emasculate this most valuable instrument in the economics of the contracting industry, this document which insists on the observance of the scientific relationship between cost and achievement, lest we find, by the "root and branch" method of reform, that in exchange for the superficial advantages of "streamlining" we have a devitalised document, a bowdlerised bill.

There was another Building Mission to the U.S.A. back in 1944, when the question of quantities was one of the points considered. I cannot do better in conclusion than requote some remarks I made in this newspaper on that earlier report.

"The quantity surveying profession in this country has grown up out of the building industry to independent stature not by its own pushing, but because the services it could offer as an independent profession were an immense advantage in the structure of an industry becoming more prolific at every turn. The profession did not make itself indispensable. If it has become indispensable it is as a result of the ever-increasing technical complexity of one of the major industries of the country."

I cannot think that our contribution towards sustaining the balance of close relationship between cost and achievement in this arena of ever-increasing technical complexity will be best achieved by bowdlerising the bills of quantities. Rather will it be by recalling that "Bills of Quantities shall fully describe the materials and workmanship and accurately represent the work to be executed." If we can keep our streamlining within these limits, so be it.

(*Concluded.*)

BOOKS

THOMAS ARCHER. By Marcus Whiffen. Pp. 96. Illustrated. (Art and Technics.) Price 8s. 6d. net.

THIS NEW VOLUME in the "Architectural Biographies" series is a scholarly and valuable little book, very well documented, illustrated and produced. Archer is justifiably described as the leading "Baroque architect" in England, for, as the author observes, there is no longer any need to flinch from that term.

Very little is known of the first half of his life, nothing of his training or travels (if any), and the fact that he left £100,000 at his death in 1743 does not necessarily imply great success in his profession, for he was born in easy circumstances and held various lucrative offices under the Crown.

Of his authenticated works, the best-known are his churches of St. Philip (1709-25, now the Cathedral) at Birmingham; and of St. John (1713-28) at Westminster. Less familiar to the general public is St. Paul (1712-30) at Deptford. In planning as in appearance, all these are Baroque churches. In the first two, there was originally a central pulpit blocking the view of the altar from the west. This ultra-Protestant arrangement, usually associated with Nonconformity, was usual in large-galleried churches of the mid-eighteenth century. He also altered Hale Church in Hampshire, adjoining his own country house, and erected there a doorway which might have come straight from Bernini's Rome.

His chief secular works were the north wing of Chatsworth, 1705; Heythrop Hall in Oxfordshire, c. 1705, rebuilt in the nineteenth century after a disastrous fire; a pavilion at Wrest Park in Bedfordshire; Roehampton House 1712; Cliveden House in Buckinghamshire; and his own house, Hale Park. The last three of these buildings have all been much altered. Hurstbourne Priors in Hampshire was demolished in the eighteenth century, and Harcourt House in Hampshire in 1903.

To this list Mr. Whiffen adds several "attributed" works including Chicheley Hall, Buckinghamshire; Addiscombe House near Croydon, demolished; Monmouth House in Soho-square, demolished; Russell House, now 43, King-street and once the headquarters of the R.I.B.A., and later of the National Sporting Club; sundry garden pavilions; Marlow Place, Buckinghamshire; Bramham Park, Yorkshire; Kingston Maurward and Chettle House, both in Dorset.

Archer shows himself the most un-English and the most Baroque of all our architects in his use of curves, his tricks of false perspective and many other details, borrowed at first hand or out of books, from the work of Bernini and Borromini in Rome.

M. S. B.

LONDON: HISTORIC BUILDINGS. By Harry Batsford. (B. T. Batsford, Ltd.) Price 7s. 6d. net.

THE IMMINENCE of the Festival of Britain probably explains the advent of several collections of photographs illustrating the principal buildings and sights of London, this volume being the latest of such books. It contains 97 excellent views, mostly of architecture, and should prove popular among the hosts of visitors who may be expected to crowd London during the coming year. The selection has been made with great discrimination from about a score of sources, but the bulk of the plates have been contributed by eight well-known and expert firms. Hardly any major historical monument has been omitted, though one would have welcomed illustrations of Woburn Walk (mentioned in the text) and of Ham House. Among unexpected "close-up" subjects are the statues on Nelson's and the Duke of York's Columns. Piccadilly-circus appears at its Blomfieldian best. The interior of Henry VII's Chapel is particularly well photographed, as is the exterior of No. 10 Downing-street. So is Lombard-street, and the garden-front of Buckingham Palace is a happy choice. Other specially good views show the Royal Albert Dock, the College of Heralds, various parts of the Inns of Court, and Bedford-square. Clarence House has a topical rather than an architectural interest, while Crewe House, the Savoy Chapel, and Holly Walk barely justify inclusion. The Introduction provides a competent and interesting preface to this little gallery of London architecture.

M. S. B.

YOUR CLUB. (Whitbread and Co., Ltd.) Pp. 58. Illustrated. Price 5s. net.

THIS attractively-produced and very readable little volume, with numerous coloured plates and other illustrations, appears anonymously in a series sponsored by the well-known firm of brewers. Among the eight previous volumes, some have an architectural interest, e.g., "Inns of Kent" and "Inns of Sport." While their commercial purpose is obvious, that fact does not diminish the intrinsic merit of their compilation and production. This volume describes, justifies and glorifies the club in all its forms, past and present, from the austere dignity of the Athenaeum to the matey surroundings of working-men's clubs in town and country. If the historical pages are chiefly concerned with the exclusive coteries of Pall Mall and St. James's-street, the remaining two-thirds of the book deal with much more democratic gatherings. Clubs for cricket, golf, yachting and angling also receive mention. The illustrations form a varied and amusing series, beginning with a frontispiece in colour from a fine lithograph by T. Shotter Boys, showing the club-houses of Pall Mall in 1841.

M. S. B.

BUILDING INDUSTRY ORGANISATION

2.—Housing Standards

[From a Correspondent]

IT is still very difficult, after five years of post-war house-building, to get any official information regarding real housing costs. Sometimes tender prices are quoted, sometimes a yard-stick of so much per superficial foot. Seldom do we learn the resultant cost of land, roads, services and building; never do we see this with the addition of architectural and supervising overheads. The man who pays the piper gets no chance of calling the tune, or the tune is so discordant that the most highly trained ear could not give it a name.

If a house seeker were permitted to provide for himself, that is if he could buy a house with his own money, he would naturally be a little more careful and precise than a person who has merely to dip into the supposedly bottomless public purse. A small matter of £100 for any unforeseen contingencies or extras that develop during the course of the work would upset his budget. He would too, if the industry were permitted to return to a sane basis of organisation, have a choice of different types of houses offered by builders competing for his order. He would buy out of the shop window; he could see what he was buying, and the price would be clearly marked in large figures.

In spite of official reticence on the subject of costs, we can get from the Girdwood Committee's Report an inkling that these are still on the rise; only an inkling because even the Girdwood Committee has to *estimate* costs. Their estimate for a house built in 1947 was £1,242, and for a house built in 1949, £1,321. Here is an increase of £79, which would have been £120, if designs and specifications had not been "simplified" to the extent of £41. Meantime the average size of houses increased from 1,029 super ft. to 1,050 super ft. Not only has the cost per super foot increased; there has been an increase in the size of the houses.

This increase has been gradual and persistent since 1945. The recommendation of a sub-committee of the Central Housing Advisory Committee in 1944 was that post-war houses should have a floor area of 900 super feet. The Ministry of Health prepared a Housing Manual based upon the report of this sub-committee and sent it to local authorities with a covering letter which recommended local authorities to proceed with their planning on a basis of 800/900 super feet. About the same time the Ministry of Works erected a number of demonstration houses at Northolt. All types except the rural house and flats had an overall floor area of 850 super feet. By 1945 the Labour Party had taken over the reins of government, and the Ministry raised this super footage to 900/950, but, as the Girdwood Committee point out, this has been increased in practice to 1,050 superficial feet.

Very few people would be so bold as to advocate down-grading our housing standards; such a suggestion would have a sinister ring; but let us examine the position and see whether a return to the recommendation of 1944 (800 to 900 super feet) could justly be termed a down-grading of standards. The Ministry of Health published a Housing Manual in 1927 which was reprinted and reissued in 1934. The recommended size of houses in that Manual was from 660 to 810 with an average of 745 super feet, for a three-bedroom and one living-room house, with kitchen, bathroom and other essential offices. Many plans were reproduced showing how perfectly good houses could be provided within the prescribed limits. A million council houses were built between the two wars to these sizes. Three million houses were built by private enterprise during the same time, and the majority of these were little if anything larger than the council houses. Let any man, before he cries out in holy horror against any reduction in the size of subsidised houses, put a foot rule over his own house and compare his overall floor area with the figure of 1,050 superficial feet which has become standard. This overall size is, in fact, unnecessarily generous.

The principal difference between the pre-war and the post-war house has been the addition of a brick out-house to take the place of unsightly shacks and sheds for coals and for storage. Let us accept this addition as an improvement; is it one which we must necessarily build now? It uses time and materials which could be freed for the building of more houses and the satisfaction of more house-less people. If we were to leave space for these out-buildings they could be added later without the tenants suffering any real inconvenience. Many of these outbuildings are planned as an extension of the frontage of the house. Apart from the unsightly effect of these lateral additions, they involve a wasteful use of land and unnecessarily increase road and service charges. These outbuildings house a second and unnecessary w.c. which, with its plumbing, adds considerably to the cost of the house. The majority of people who are prepared to house themselves without cost to public funds will be perfectly happy with only one w.c. per house.

It was a fetish of the early town planners to reduce the number of houses to the acre. No one will want to go back to the bad days of back-to-back planning, but there must somewhere be a happy medium. The effect of too open development has been the horrid sprawl of towns over the countryside. This, in turn, has brought about the need for high blocks of flats, concentrating more and more "units of accommodation" on the urban acres, and the cure for overcrowding becomes greater overcrowding. Many local authorities' layouts are unintelligent and wasteful. There is ample scope for economies in siting and layout without any loss of amenity; indeed intelligent siting should improve the amenities.

If one were to bring an unbiased mind to the reconsideration of the economics of house-building to meet the country's present straitened financial circumstances there is no doubt that savings could be effected in the size of the house, in the use of land and in the charges for roads and services. Economies which must be avoided are the use of inferior materials, of badly seasoned timber, the cheapening of ironmongery; these and other so-called economies to which local authorities have to resort to bring their tenders within the figure which the Ministry of Health will approve should be avoided like the plague. Certainly our town councils, who are essentially health authorities, should not themselves be pioneers in the erection of sub-standard houses.

(To be continued)

INQUIRY BUREAU

Determination of Contract: Client's Legal Obligations

Q.—I should be obliged by your opinion on the following matter:—

A building owner, having decided to build a dwelling house, requests an architect to prepare plans and specification and obtain tenders from a number of builders. A licence is granted, and the lowest tender accepted by the architect. The builder made preliminary preparations to commence work in that he cleared the site of rubble and ordered materials, some of which were delivered upon the site. A meeting took place upon the site between the client, architect and builder to view the site and discuss the contract to build, whereupon the client became aware that certain items were omitted from the specification, and decided to abandon the project. The client could have been aware of the omissions previously but rather left matters in the hands of the architect. The client has settled the architect's account for his work.

Bearing in mind that no contract had been entered into with the builder, is the client under any obligation to the builder for refusing to proceed with the contract? The builder claims for:—

1. Cost of labour and cartage prior to architect's advice to stop.

2. Administrative charges in preparation of tender (normally recoverable from gross profit):—

(a) Preparation of quantities at scale fee of 2½ per cent. of cost of house.

(b) Staff time and travelling expenses in obtaining quantities for and preparation of tender.

(c) Staff time in preparing schedule, ordering materials from merchants, setting out joinery, making works orders, meeting on site, and correspondence and visits to the architect consequent upon decision to abandon the project.

3. Loss of estimated net profit on contract at 7½ per cent. of cost of house.

I should like to add that the client had not yet completed the purchase of the site.

INTERESTED.

A.—A legal correspondent writes:—Before replying directly to this hypothetical case it is necessary to make the following observations:—

1. A tender is an "offer," and once an *unconditional* acceptance has been received, a contract good in law is set up, even though the tender was submitted without defining the minute conditions of the work to be done.

2. Sometimes the invitation to tender states that the successful tenderer will be required to sign a formal contract later on, the effect of which is to express in formal language the agreement between the parties. Often this is merely a *wish* expressed, in which case the court would consider a final agreement had been arrived at, even if this were not actually done.

3. Sometimes, however, the invitation to tender states that the signing of a formal contract is to be a *term* or *condition* of the bargain, in which case *the contract is not complete until the formal contract has been signed.* It is largely a question of construction as to whether the execution of the further formal contract *is* a condition or term of the

bargain, that is, a *condition of final acceptance*. Quite obviously, this would be the case where *material* matters have yet to be agreed.

4. The architeet must have had proper authorisation from the employer to accept the lowest or any tender, and it is unusual for an architect to accept a tender on his employer's behalf without a reference in regard to a formal contract later.

5. There is, in general, no obligation on the part of a contractor to obtain proof of the employer's ownership of the building site. In the case under consideration, the employer would be estopped from denying his ownership of the site.

To conclude, on the simple facts put forward, and assuming the architect had proper authority to accept a tender and that there was no *term* or *condition* requiring a formal contract, I am of opinion that a complete contract existed between the parties and that, as the contractor is prevented by the action of the employer from carrying out his part of the bargain, under these circumstances, he appears to have a claim for loss or damage, and such a claim could include the items detailed.

I am not concerning myself with the position as between the architect and employer, which may involve a question of negligence, for that is not a matter that affects the contractor; neither do I think it necessary to comment in detail upon the various items of the claim. In such a case, should litigation follow, the contractor's legal representatives would advise him on this point. There is no suggestion, again, as to the circumstances under which the contractor entered upon the site: was it with the architect's permission or knowledge? The answer to that question might also affect the matter.

TIME-TESTING OF NEW BUILDING BLOCKS

A Technical Paper

THE PRACTICAL value of any new type of building block is dependent on the construction time of buildings for which the new block is used. As it is not always possible to keep full records of the time taken to build full-scale houses by a new method, an alternative method, in which a small-scale test wall is built, can be used to provide the information needed.

National Building Studies Technical Paper No. 9, "Test Walls for Assessing Construction Times with New Building Blocks," published recently by H.M.S.O. for D.S.I.R., price 9d., gives details of such tests and the results they have given.

The type of test wall used includes all the main features of construction of a full-scale house, but involves only a fraction of the work that would be necessary for a full-scale test.

The construction times for the test wall, taken in conjunction with existing data for other types of block used in house building, can provide, by means of a simple calculation, a reliable assessment of the construction time to be expected when the new block is used for normal small house construction.

B.R.S. Digest

The Building Research Station, Garston, Watford, Herts, has recently issued Digest No. 25, "The Selection of Clay Building Bricks."

THE PROGRESS OF REINFORCED CONCRETE

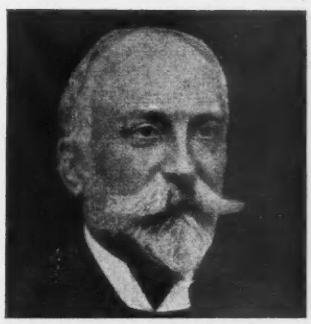
A Century's Work of Development

[From a Correspondent]

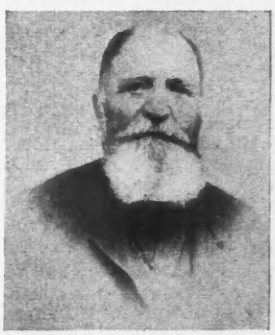
THE great extent to which reinforced concrete is used to-day makes it difficult to realise that it was only a hundred years ago that the idea of increasing the tensile strength of concrete by embedding another material in it was first put into practice. It is perhaps still more difficult to realise that the first reinforced concrete structure was built in Great Britain only about fifty years ago. Yet so it is. All the early pioneers were Frenchmen, and the centenary of the invention was recently celebrated in Paris with the support of the President of the French Republic.

The first man to produce a composite concrete and iron structure seems to have been J. L. Lambot, who made a boat of these materials about the year 1850, and this was shown at the Paris exhibition of 1855. About the same time François Coignet used concrete in which he embedded iron bars of I section for the roofs of some terrace houses. A little later Joseph Monier, a gardener, made some flower-boxes of concrete in which was embedded a mat of iron bars, and in 1867 he took out a patent for troughs for agricultural purposes made of cement and iron. It seems, therefore, that François Coignet was the first to use reinforced concrete in building construction, and that Monier was the first to use the material for a water container. It is interesting to note that concrete pipes known as "Monier" pipes are still made. In 1872 Monier built his first reinforced concrete water tank. In 1880 his patents were acquired in part by the Wayss concern in Germany, and this was the beginning of the great German firm of specialists in reinforced concrete now known as Wayss and Freytag.

François Coignet



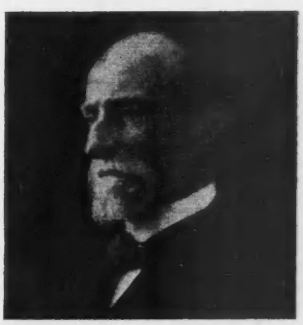
Edmond Coignet



Joseph Monier

François Hennebique

L. C. Mouchel



Armand Gabriel Considère

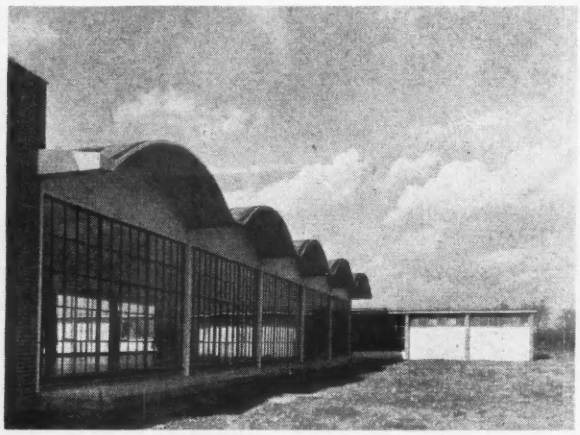


Fig. 1.—Canteen at May and Baker's factory, Dagenham. Edward D. Mills, F.R.I.B.A., Architect

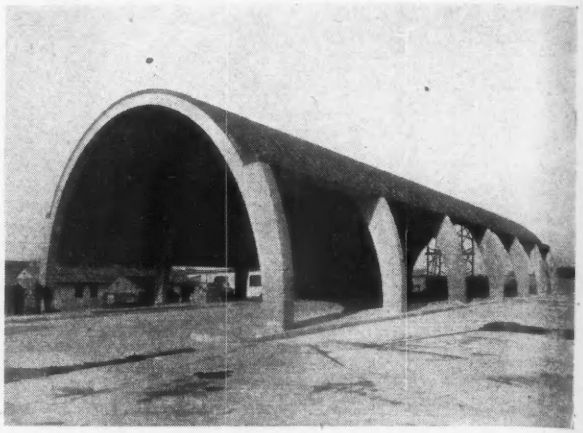


Fig. 2.—Newbury Park bus station, for L.P.T.E. Oliver Hill, F.R.I.B.A., Architect

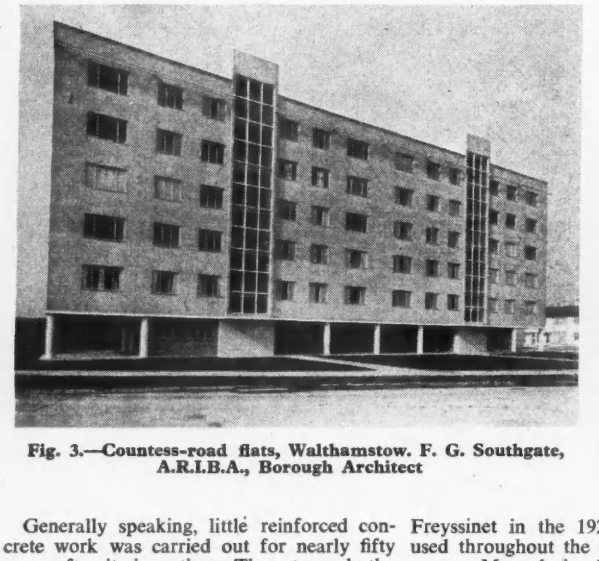


Fig. 3.—Countess-road flats, Walthamstow. F. G. Southgate, A.R.I.B.A., Borough Architect

Fig. 4.—Prestressed concrete bridge, near Boston, Lincs. L. G. Mouchel and Partners, consulting engineers

Generally speaking, little reinforced concrete work was carried out for nearly fifty years after its invention. Then, towards the end of the last century, another group of pioneers, or developers, emerged in the persons of Edmond Coignet (son of François), Considère, Mouchel, Hennebique, and Rabut in France, and Emperger in Austria. These men developed their own special systems, and the rivalry between them did much to make the material popular. Companies were formed in Great Britain to exploit the Coignet, Considère and Mouchel-Hennebique systems. The first reinforced concrete structures built in this country were a flour mill and a river wall at Swansea, and a river wall at Southampton designed by Mouchel. Firms bearing the names of Mouchel, Considère and Coignet are still active in this country in the design of reinforced concrete, although some of the special systems they were formed to operate have long since been abandoned and their principles of design are generally the same as those of any other consulting engineer.

It would seem that the French have a particular flair for concrete. Not only did Frenchmen invent and develop the process last century, but they have been responsible for many developments since. The most important of these is prestressed concrete, which was developed in France by Eugene Freyssinet in the 1920's and is now being used throughout the world. Hoyer in Germany, Magnel in Belgium, Schorer and Hewitt in the United States of America have also taken a considerable part in the development of prestressed concrete, but the most important work was done by M. Freyssinet in France.

The illustrations are of some recent reinforced concrete work in this country. Fig. 1 is an example of a thin reinforced concrete vault roof (commonly known as "shells"), which originated in Germany some years ago and is now becoming popular in Great Britain due to its appearance and to the large floor areas unobstructed by columns which this method makes possible. Fig. 2 shows a bus station, the unobstructed floor space in this instance being obtained by the use of reinforced concrete arch ribs. A block of residential flats built entirely in reinforced concrete is shown in Fig. 3; more than twenty blocks of flats have been built in reinforced concrete since the war, or are now in course of construction, in the London area. The prestressed concrete bridge built in Lincolnshire in 1948 shown in Fig. 4 is the first bridge of this type built in Great Britain. It has a span of 74 ft. On the Continent many prestressed concrete bridges with spans of more than 200 ft. have been built.

NEW COMPANIES

Fred Charles, Ltd. (489356.) Regd. Dec. 13, 74/8, High-st., Redcar, Yorks, bldrs. Nom. cap.: £20,000. Dir.: F. C. R. Figueroa, 3, Marton-rd., Bridlington, Yorks.

Horace Lucas and Son, Ltd. (489361.) Regd. Dec. 13, bldrs., contractors, etc. Nom. cap: £3,000. Dir: H. Lucas, Rydal, Park Side, Prescot.

Selmor Shopfitters, Ltd. (489488.) Regd. Dec. 15, 7, Endsleigh-crt., Upper Woburn-pl., W.C.1. Nom. cap.: £500. Sub.: H. Turner, 83, Applegarth-dr., Newbury Park, Essex.

Mallett's Baffles, Ltd. (489476.) Regd. Dec. 15, 25, Riggindale-rd., Streatham, S.W.16, contractors and constructional engrs. Nom. cap.: £1,000. Dir.: S. A. Mallett.

Allard Bros., Ltd. (489498.) Regd. Dec. 16, 6, Muston-rd., E.5, bldrs, contractors, etc. Nom. cap.: £500. F. G. Allard, 11, Longdeacon-rd., Chingford, E.4.

Swainston and Son, Ltd. (489529.) Regd. Dec. 16, 60, Hadyn Park-rd., Shepherds Bush, W.12, bldrs., bricklayers, etc. Nom. cap.: £100. Dirs.: J. H. Swainston and Mrs. F. Swainston, 60, Hadyn Park-rd., W.12.

William Miller (Blackburn), Ltd. (489533.) Regd. Dec. 16, 164, Whalley Range, Blackburn, bldrs., bldg. contractors, etc. Nom. cap.: £4,000. Dir.: Florrie Miller, 9, Logwood-st., Blackburn.

H. B. Pownall and Sons (Builders), Ltd. (489544.) Regd. Dec. 18, 7, Runnymede-ave., Cleveleys, nr. Blackpool. Nom. cap.: £5,000. Dir. H. B. Pownall.

Herbert H. Drew and Son, Ltd. (489545.) Regd. Dec. 18, 5, Station-rd., New Milton, Hants., bldrs., contractors, etc. Nom. cap.: £25,000. Dir.: H. H. Drew, Shabash, Osborne-rd., New Milton, Hants.

R. O. Wharton, Ltd. (489557.) Regd. Dec. 18. Back Leazes-st., Gateshead-on-Tyne, plastering and tiling contractor. Nom. cap.: £10,000. Dir.: R. O. Wharton, 237, Carr Hill-rd., Gateshead-on-Tyne.

PARTNERSHIP AGREEMENTS

By JOHN LYMESTER

THE Partnership Act, 1890, contains the law regarding partnerships. This Act is very comprehensive, but, of course, case law must also be taken into account. Section 1 of the Act defines a partnership as follows: (1) Partnership is the relation which subsists between persons carrying on business in common, with a view of profit.

(2) But the relation between members of any company or association which is: (a) registered as a company under the Companies Act, 1862, or any other Act of Parliament for the time being in force and relating to the registration of Joint Stock Companies; or (b) formed or incorporated by or in pursuance of any other Act of Parliament or letters patent or Royal Charter; or (c) a company engaged in working mines within and subject to the jurisdiction of the Stanneries; is not a partnership within the meaning of this Act. Section 2 continues with rules for determining the existence of a partnership.

When persons have entered into a partnership, it is important for them to have a partnership agreement, although the Act lays down rules if there is no such agreement. The agreement should set out fully the terms which have been settled between the respective partners, but should contain the following provisions among any others:—

(1) Full names and private addresses of each of the partners. (2) The firm name in which the business is to be carried on and all the addresses of the places of business at which it is intended to trade. In this connection, it is important to remember that in many cases it will be necessary for the partnership to be registered under the Registration of Business Names Act, 1916. This is so in all cases where the name does not consist of all the surnames of the partners. In the case of doubt, application should be made to the Registrar as to whether or not registration is necessary. It is also to be remembered that the Registrar has the right to refuse any name which, in his opinion, is undesirable.

(3) Details of the type of business to be carried on. (4) The period for which the partnership is entered into. It will be appreciated that if it is for a fixed period and the partnership continues after this time, that the partnership will then be a partnership at will, but will be subject to the terms contained in the original partnership agreement. If the partnership is for no fixed period, then it may be determined by notice given by any partner at any time.

(5) The amount of capital to be contributed by each partner and whether or not this is to be a fixed capital, or whether undrawn profits and salaries less drawings, are to be added thereto. (6) The amount of drawings of each partner when payable. (7) Whether interest is to be allowed on capital. It should be noted that if it is not provided for in the agreement, partners are not entitled to interest on capital.

(8) Whether or not interest is to be allowed on advances and current accounts. It should be noted that the Act provides that five per cent. is to be allowed. It is preferable, however, to fix this in the agreement. (9) The amount of remuneration of each partner and how payable. Again it should be noted that unless this is provided for in the partnership agreement, partners are not entitled to remuneration.

(10) The ratio in which profits or losses are to be shared, including any capital profits or losses. Again, Section 24 of the Act provides that all partners are entitled to share equally in the profits and losses of the business unless there is an agreement to the contrary.

(11) Provisions as to the repayment of expenses. The Act actually provides that the firm must indemnify every partner in respect of payments made and personal liabilities incurred by him: (a) in the ordinary and proper conduct of the business of the firm, or (b) in or about anything necessarily done for the preservation of the business or property of the firm. (In view, however, of the present difficult position as regards partnership expenses, it is as well to lay down a general rule.)

(12) The responsibility of each partner in the management of the business and again, if any partner is to have limited authority it must be remembered that the Act provides that all partners may take part in the management of the partnership business.

(13) Provisions for the introduction of new partners. It must be remembered that a new partner cannot be introduced without the consent of all, by the provision of the Act.

(14) Provisions for the continuance of the partnership and the winding-up of its affairs in the event of the death or bankruptcy of a partner.

(15) Provisions for the valuation of goodwill upon the retirement or death or bankruptcy of a partner, and in the event of the admission of a new partner. In this connection, there are many methods suggested for the valuation of goodwill, but in my opinion, goodwill should be valued on the basis of "super profits."

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(16) A provision as to how differences of opinion may be settled. Normally this can be dealt with by the appointment of an arbitrator, although the Act provides that differences of opinion may be settled by a majority of the partners, except that there cannot be any change in the nature of the partnership without the consent of all.

(17) Provision as to the place where the books of account are to be kept and that they may be inspected at all reasonable times by all partners. The Act itself provides for such inspection. Provision shall also be made for the audit of the books of account and the conclusiveness of such accounts in the partnership affairs.

It must be remembered that despite the terms contained in the partnership agreement, the mutual rights and duties of partners, whether they are contained in the partnership agreement or are according to the Partnership Act, can be varied if all the partners agree, whether such consent is expressed or can be inferred from a course of dealing.

Partnership in business entails good faith between the partners, the partnership assets only being used for the partnership business and partners making no secret profits. As mentioned before, the partnership will end at the termination of a fixed period, or in other cases, by notice by a partner, but the partnership can also be brought to an end by application to the Court, in the following circumstances:—

(a) When a partner is found lunatic by inquisition, or in Scotland by cognition, or is shown to the satisfaction of the Court to be of permanently unsound mind, in either of which cases the application may be made as well on behalf of the partner by his committee or next friend or person having title to intervene as by any other partner; (b) when a partner, other than the partner suing, becomes in any other way permanently incapable of performing his part of the partnership contract;

(c) When a partner, other than the partner suing, has been guilty of such conduct as, in the opinion of the Court, regard being had to the nature of the business, is calculated to prejudicially affect the carrying on of the business; (d) when a partner, other than the partner suing, wilfully or persistently commits a breach of the partnership agreement, or otherwise so conducts himself in matters relating to the partnership business that it is not reasonably practicable for the other partner or partners to carry on the business in partnership with him;

(e) when the business of the partnership can only be carried on at a loss; (f) Whenever, in any case, circumstances have arisen which, in the opinion of the Court, render it just and equitable that the partnership is dissolved.

One final point of considerable importance is the liability for the partnership income tax. Assesment to income tax is made according to the normal rules upon the partnership in the firm's name, but when the liability has been ascertained, it is divisible among the partners in accordance with their private taxation circumstances. It must be remembered that although the assessment is normally based on the results of a preceding financial year, the assessment is to cover the profits made in the income tax year and must be divided between the partners in the proportions under which they draw salaries, receive interest on capital, or share profits in the actual income tax year. When each

partner's individual share has been ascertained, it is not an expense of the partnership, but should be charged to their private current accounts.

Finally, partnership depends upon good faith. Normally all questions can be settled by arrangement, but to avoid disputes and allow for clarity in the preparation of the accounts, it is advisable to have a partnership agreement and the expense of such agreement is normally repaid by the prevention of disputes between the partners.

INCENTIVE SCHEMES

Statement by Sir Harry Selley

FOLLOWING his criticism recently of the settlement reached by the National Federations of Building Employers and Operatives on the matter of incentives payments, SIR HARRY SELLEY, president of the Federation of Master Builders, again referred to the subject of incentives schemes at the annual dinner of the Cardiff branch of his Federation which was held on January 5. He said:—

"Great publicity has been given to the statements I made recently on the Incentives Agreement which has just been reached. I must again make it clear that my Federation is not opposed to incentives schemes in principle, indeed it welcomes properly administered schemes which will give increased rewards for increased production. Unfortunately, owing to the general set-up of our industry, it is only a very small percentage of building undertakings which are able to operate properly conceived schemes.

"The Wrong Spirit"

"I must point out that our experience shows that up to now incentives have, in the main, been operated not in the spirit originally planned but simply as a device to give increased hourly rates to attract labour from one building site to another without any regard to the subsequent production. At the Blackpool Conference of my Federation three years ago, I publicly stated 'that the only way the industry could increase its productivity was through the pay packet.' I still maintain this to be true, but only by the application of *real* payments-by-results schemes.

"At the beginning of this new year and the turning of the half-century, we have to take stock of future prospects for the building industry. I am afraid 1951 will be a severe testing time for us all. With the international situation still very obscure and a substantial rearmament programme in progress, which must be accelerated during the year, further controls are already upon us and we are likely to see still more imposed. It is therefore apparent that the building programme will be diminished rather than expanded so far as the everyday work of the normal builder is concerned.

"The nature of the industry's work is bound to take on a different complexion. This means that every firm must take stock of its position and certainly endeavour to increase its efficiency both in administration and actual operation of its day-to-day activities."

Engineers' Year Book

The Institution of Structural Engineers has just issued a new Year Book and List of Members. It is priced at 5s. to non-members.

COMPARATIVE PRICES OF MATERIALS

Copyright *The Builder*

	January, 1939	*January*, 1950	*January*, 1951
	£ s. d.	£ s. d.	£ s. d.
FLETTONS	2 6 3	4 5 0	4 12 0
BLUE WIRECUTS	7 4 0	16 14 6	17 18 6
GLAZED BRICKS	24 0 0	51 0 0	53 0 0
THAMES BALLAST	7 3	15 9	15 9
PIT SAND	7 9	15 2	15 2
¾ in. SHINGLE	7 3	15 2	15 2
¾ in. BROKEN BRICK	11 3	17 6	17 6
PORTLAND CEMENT	2 2 0	3 10 6	4 1 0
PORTLAND STONE	4 5	6 1½	6 4½
SLATES—			
24 by 12 in.	31 5 0	69 18 0	71 0 0
20 by 10 in.	20 15 0	46 6 3	46 18 6
16 by 10 in.	14 7 6	31 13 3	32 3 6
TILES—			
Machine made	4 2 6	9 14 6	10 0 0
Hand made	4 17 6	11 11 0	11 17 6
R.S. JOISTS	16 10 0	34 0 0	34 0 0
SHEET LEAD	23 0 0	114 15 0	156 5 0
LINSEED OIL	2 11	15 6	16 8
GROUND ENGLISH WHITE LEAD ...	2 10 0	7 9 6	9 3 6
WHITE LEAD PAINT	16 8	2 5 0	2 9 0
RED LEAD	1 18 0	7 13 0	9 12 6

OFFICIAL NOTIFICATIONS

Zinc, Copper and Copper Alloys

The Ministry of Supply states that the list of prohibited uses for zinc, copper and copper alloys issued by them on December 28, has been misunderstood by sections of the Press and industry. While bearing in mind that the list is provisional, industry, says the Ministry, should note that the intention is :—

(1) Galvanised articles are only prohibited if they appear under the headings about galvanising. For example, the ordinary household bucket does not appear under "galvanised hollow-ware" and its manufacture is not banned. Buckets do appear under "household appliances and domestic utensils"; this item relates to buckets made in zinc, copper or their alloys. Thus brass or copper buckets will be prohibited.

(2) For listed articles made for the most part of other materials, but containing a very small but indispensable amount of zinc, copper or alloy for a particular purpose, e.g., gear wheels, the issue of a special exemption from the Order will be considered.

Export Licensing Regulations

The Board of Trade states that the existing export licensing regulations are contained in one year-old Consolidation Order and eight subsequent amendments. These have now all been embodied in a new Consolidation Order, giving full details of all goods subject to export licensing. This Order, the Export of Goods (Control) (Consolidation) Order, 1950 (S.I. 1950, No. 2138, price 1s., obtainable from H.M.S.O. branches or through any newsagent or bookseller), was published on January 5 and came into operation on January 8. The Order makes no change in the existing regulations.

Insulated Electric Cable Fire Test

A report made by the Fire Research Station of the Department of Scientific and Industrial Research on "A Comparison of the Flame-Retardent Properties of Plastic-Insulated and Rubber-Insulated Electric Cable," has been issued as a booklet by the British Plastics Federation, price 2s. 6d.

Factory Visits for Festival Visitors

British manufacturers who are willing to receive visitors at their factories during the Festival of Britain, 1951, are invited to send particulars to the Council of Industrial Design. The Council will compile a list of such firms and arrange for it to be carried at all Industrial Information Bureaux in the official Festival Exhibitions.

BRIGHTNESS ENGINEERING

Bright and Comfortable Vision

PROGRESS made in the study of the brightness relations necessary for ease and comfort of seeing was outlined in a paper entitled "Brightness Engineering" which was read by MR. W. ROBINSON, B.Sc., to members of the Illuminating Engineering Society on January 9. Brightness engineering, Mr. Robinson explained, was a term coined to embrace the application of the results of this work to lighting practice. Its prospects of successful adoption depended on the acceptance of agreed brightness criteria and on the existence of adequate brightness design data and suitable instruments for brightness measurements in interiors.

It was generally agreed, he continued, that the control of all interior brightness ratios in relation to the work and source brightnesses was essential for sustained, comfortable vision and there was a growing tendency to use a 3/1 ratio as a guide. The speaker discussed the experimental background of this ratio and suggested that the time was ripe for an investigation into the establishment of a general brightness code. He suggested that this investigation would be assisted by adopting a provisional code, such as the 3/1 ratio, as a basis for reference.

Brightness design data were now available in the form of interreflection tables which enabled the average brightness of floor, walls and ceilings to be predetermined in a manner similar to the predetermination of illumination from coefficient of utilisation tables.

Comprehensive Data Compiled

These tables were based on the use of a "Room Coefficient," which, as with the lumen design "Room Index," was a simple function of the room dimensions. All interiors, regardless of size or dimensions, which had the same value of room coefficient, had the same interreflection characteristics. It had therefore been possible to provide comprehensive interreflection data covering a very wide range of interior sizes and shapes in a compact set of tables. The brightnesses in foot-lamberts of the various room surfaces were given by appropriate tables as a proportion of the average horizontal room illumination, and their predetermination resolved itself into a simple additional step in the normal illumination design process. Mr. Robinson also gave a brief description of the field flux method of lighting design in which, he said, emphasis was placed on the zonal distribution of light flux rather than on brightness ratios. The criterion adopted was based on natural lighting conditions out of doors which had been judged from observations to be most acceptable to human beings. These optimum visual conditions, he said, were measured by a special instrument and were transferred to a flux chart which was used as a basis for interior lighting design. By use of interreflection tables and special design methods, interior lighting was made to reproduce, as far as possible, these optimum visual conditions.

Reviewing the facilities available for the routine measurement of brightness, the speaker said that though the methods of brightness measurement now available were technically adequate for the purpose of brightness engineering, cheaper and more compact instruments would no doubt be developed as brightness engineering gained ground.

CODE OF PRACTICE

Ventilation

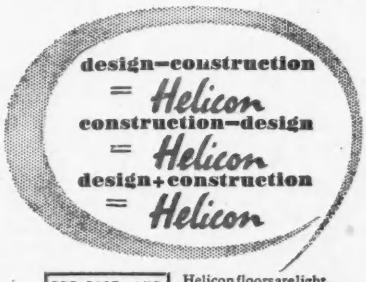
THE Council for Codes of Practice for Buildings has issued, in final form, Chapter I (C), "Ventilation," of the Code of Functional Requirements of Buildings. This chapter was previously issued as a draft for comment, and has now been revised, in the light of comments received, by the Council's Technical Consultative Group.

The chapter deals with requirements for the ventilation of buildings for human occupancy in relation to the rate of fresh air supply, air movement, temperature of incoming air, humidity and purity of air. Recommended minimum rates of fresh air supply are given for factories, hospitals, houses and flats, offices and places of general public assembly. Recommendations are also made concerning air movement desirable for summer and winter in living rooms and other rooms for sedentary and light manual occupation and also for buildings in which heavy manual work is done.

The chapter brings to notice certain points to be observed in the control of the temperature of air introduced by mechanical ventilation so as to avoid undesirable conditions. The effect of the humidity of the air is also considered. A formula is given for calculating the flow of air produced by temperature differences and by varying the ratio of areas of inlets and outlets.

Although the appropriate methods and designs for ventilating systems are dealt with in the General Series Codes, the appendices of this chapter give valuable information on the general principles of natural and mechanical ventilation and the factors governing the choice between the two systems.

Copies of the chapter may be obtained from the British Standards Institution, 24/28, Victoria-street, London, S.W.1, price 2s. 6d., reference CP 3—Chapter I(C)(1950).



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ENGINEER TO DESIGN COUNCIL HOUSES

Objectors Defeated

DESPITE objections over a recommendation that their surveyor, Mr. R. C. Bestow, who is not a qualified architect, should prepare designs for the proposed erection of 80 houses, Hebburn Urban Council at a recent meeting authorised him to proceed with the scheme.

Mr. Bestow, it is reported, informed the meeting that he was a civil engineer, but had not qualified as an architect. Hitherto the Council had employed a firm of architects in private practice to design their new housing schemes.

A report of the debate on the matter, which appeared in the *Newcastle Journal* on December 20, states: Supporting the proposal that the surveyor should design the houses, Coun. W. McConway said that when Mr. Bestow was appointed, he received the majority of votes because he had with him plans of houses he had designed for his previous employers.

Coun. McConway added that while at Hebburn Mr. Bestow had proved that he could build council houses cheaper than private contractors.

Coun. Mrs. McIntyre urged that the firm of architects should be asked to do the work, and Coun. Bradley, who said he had been a trade unionist longer than anyone else present, declared he did not stand for blacklegging and that was what the proposal amounted to. He urged that there was professional etiquette to be considered.

Coun. W. M. Jackson claimed that if the surveyor designed the houses it would mean a saving of about £2,400. What they were concerned about was not piling up fees, but bringing them down in order to reduce rentals from the present figure of 23s. 6d.

Coun. J. E. Jenkins stressed that their main object was to build houses of as good a type as possible at a reasonable rent, and for that reason he wanted very much to see this proposal confirmed.

The recommendation that the surveyor be asked to design the houses was eventually carried by 11 votes to four.

New Year Greetings

We gratefully acknowledge the following additional diaries and calendars which have been received from: Kent & Sussex Contractors, Ltd., Oldacres & Co., Ltd., Armstrong Cork Co., Ltd.

Annual Report on Further Education

The Manchester and District Advisory Council for Further Education, Education Offices, Deansgate, Manchester, 3, has recently published its Annual Report for 1949-50.

Post Office Year Book

For the first time since 1934, the G.P.O. has just issued an illustrated account of its many activities during the past year in a 92-page booklet entitled "Post Office 1950." It opens with a foreword by the Postmaster General, the Rt. Hon. Ness Edwards, M.P., and is divided into nine chapters, each dealing with a separate aspect of Post Office work. Facts about P.O. buildings are given in the chapter headed "Personnel and Accommodation," and Appendix III traces the amount of money spent each year since 1934 on new buildings.

NEWS IN BRIEF

N.C.B. to Prevent a Church's Subsidence

An application will be heard in the Coventry Consistory Court on January 20, from the West Midland Divisional Coal Board, in connection with the strengthening of the fabric of Astley Church, Nuneaton. This seventeenth-century building has a pillar of coal under it estimated to contain 790,000 tons and to be worth about £1,800,000. Last year the Coal Board was granted a faculty to sink four 20-ft. trial holes to examine the foundations. It was stated then that the Board would provide a concrete cushion under the Church to prevent subsidence. The application has become necessary owing to protests from villagers. The N.C.B. has given an assurance that no coal workings would be commenced under the church for at least five years.

Tuberculosis Centre Scheme

S. W. Milburn and Partners, F.R.I.B.A., Esplanade, Sunderland, have been appointed architects for a £2,000,000 tuberculosis centre on the outskirts of Belfast for the Northern Ireland Tuberculosis Authority. There will be a 500-bed hospital, with operating and X-ray theatres, houses for families suffering from tuberculosis, workshops to employ 200 patients, shops, hostels for nurses and houses for the medical staff.

Company's Increased Prosperity

In a recent announcement, the directors of the Associated Portland Cement Manufacturers, Ltd., stated that this year's total dividend would be 5s. 6d. per share, compared with a total dividend of 4s. 6d. per share the previous year. The announcement stated that it was pleasing that the increased prosperity coincided with the jubilee year of the company, especially as under the extended profit-sharing schemes, the staff and workmen would share in the increased distribution. All workmen who were on pension were to receive a jubilee bonus of one year's pension.

Memorandum on Planning Act

A memorandum on the working of the Town and Country Planning Act, 1947, together with suggestions for its amendment, has been prepared by the Country Landowners' Association. The Association's main comments are directed at the financial provisions of the Act concerning claims for loss of development values and the levy of development charges.

Building Societies' Hopes

"Our hopes of being able to play a more active part during 1950 in the solution of the housing problem have, alas, not been realised, but we must continue to hope that this time will come soon, not from any motive of vanity or self-aggrandisement, but because we are sincerely convinced of the soundness of the principle of home-ownership," says Mr. W. W. Wetherill, J.P., chairman of the Building Societies' Association in a New Year message to member societies.

Registered House-Builders' President

Mr. C. Douglas Calverley, of Leicester, has been elected president of the Federation of Registered House-Builders, which is affiliated to the National Federation of Building Trades Employers. Mr. Calverley was a member of the British Building Team which visited the United States in 1949 under the auspices of the Anglo-American Productivity Council.

A 100th Birthday

Mr. Alfred Crundwell, of Tunbridge Wells, where he has lived since 1869, has just celebrated his 100th birthday. Trained a builder, he became manager to Strange and Sons, at a salary, he recalls, of 8d. per hour, and towards 1900 launched out on his own. For 15 years he served on the Southborough Urban Council.

Firm's 90th Anniversary

On December 11 last, J. and C. Bowyer, Ltd., builders, of Upper Norwood, S.E.19, celebrated their 90th anniversary by giving a dinner and smoking concert to all their employees, among whom were eight who had completed over 40 years' service. A souvenir gold pencil, suitably inscribed, was presented to everyone present.

A New House-Building System

A method of house-building in concrete which, it is claimed, enables a house to be erected in approximately half the time required by traditional methods, has been devised by Mr. H. Howard-Smith and British Steel Constructions (Birmingham), Ltd. The shells of houses built by this method are of factory-made slabs of lightweight concrete, either brick-faced or with rendered finish. The production of these slabs is organised on a continuous conveyor belt system and the slabs are moved into position by the use of a patent building gantry. The success of this method depends on the adherence to a highly organised time-table of erection in progressive stages. Over 1,400 houses have so far been built by this method in Birmingham and surrounding districts.

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TRADE NEWS

Concrete for Gambia

One of the difficulties of building in Gambia is the absence of concrete aggregate. The nearest deposits are found 70 to 80 miles away in the river Niger and supplies have to be brought down river by canoe, which is possible only in two or three months of the year. Concrete, Ltd., 16, Northumberland-avenue, W.C.2, have recently shipped to Gambia 420 sq. yds. of "Bison" floor units needed for two blocks of flats at Bathurst. A further order for 5,000 sq. yds. has been received for the Victoria Hospital, Bathurst.

Snow Loaders in Newcastle

Jack Olding and Co., Ltd., of Hatfield, Herts, inform us that two Barber-Greene Olding snow loaders were used by the Newcastle-upon-Tyne City Council in the recent heavy fall of snow. It is claimed that these machines handled snow sixteen times faster than would have been possible by hand.

Director Appointed

Messrs. Marshall Andrew and Co., Ltd., 31, Queen Anne's-gate, St. James's Park, S.W.1, announce that Mr. H. M. Garland Wells, M.A.(Oxon.), has joined their board of directors.

Lighting for Selling

Advantages gained through the latest developments in the technique of applying "Atlas" coloured fluorescent lighting to shop displays, with particular emphasis upon stage and store lighting, are described and illustrated in a leaflet, "Lighting for Selling," issued by Thorn Electrical Industries, Ltd., 105-109, Judd-street, W.C.1.

Book of Historical Colours

The first post-war edition of their "Tint Book of Historical Colours," has been published by Thos. Parsons and Sons, Ltd., 70, Grosvenor-street, London, W.1. There are no major alterations in the colours, though slight improvements have been incorporated in this volume as a result of fresh information which the firm has gathered.

Firm's List of Motors

A pocket-size booklet containing details of a selection of the more commonly used types of their A.C. and D.C. motors and control gear has been issued by Higgs Motors, Ltd., of Witton, Birmingham. The firm states that no time limit is placed upon the guarantee which is given with each machine.

New Diesel Roller

The introduction of the new Kent 2½-ton diesel roller has been announced by Charles A. Preece, Ltd., who are responsible for its distribution. The roller is fitted with a newly designed gearbox in which is incorporated a built-in hydraulic device which prevents the roller from being reversed until brought to a momentary stop and thereby eliminates gearbox fractures and excessive wear. Hydraulically operated internal expanding brakes are another feature of this machine.

Waterproofing Material

A. D. Foulkes, Ltd., Ludgate-hill, Birmingham, 3, have announced that they are now distributing "Aquella," a waterproofing material which was originally developed in France and is stated to have been first used extensively in underground fortifications of the Maginot Line. Mixed with water, it may be applied to masonry surfaces.

THE SCOTTISH BUILDER

NEW BUILDINGS

Bellshill.—Plans to be prepared for factory to be erected at Main-st. and for which the architects, etc., are Frederick Smith & Partners (F. & F.S.I.), 4, Regent-st., The Cross, Hamilton.

Bishopbriggs.—Plans in hand for new block for the Archdiocese of Glasgow, 12, Park-circus, Glasgow, to be erected at the Kenmuir-st. St. Mary's Boys' School, Lanarkshire, and for which the architect is John J. Taggart, 261, West George-st., Blythswood-sq., Glasgow, W.C.2.

Chryston.—Plans in hand for new block at the Mental Hospital, Stoneyelts, Lanarkshire, for the Western Regional Hospital Board, for which the architect is Forbes Morrison (F.), 64, West Regent-st., Glasgow, W.C.2.

Culter.—Aberdeenshire C.C. to erect a scheme of 16 houses and other accommodation for which the architect is Alexander Gill (F.), 25, Union-terr., The Viaduct, Aberdeen.

East Kilbride.—Plans to be prepared for the third development of Lanarkshire houses with garages at the Limekilns housing site for which the architect is Donald Reay (F.), Torrance House, East Kilbride.

Forfar (Angus).—Acquisition of over 5 acres of land for primary school at Whitehills has been approved by Scottish Education Department.

Glasgow.—Corporation to have plans prepared by the City Engineer's Department, Municipal-bldgs., George-sq., for fire station at Cuthelton-st.

Greenock.—Plans are to be prepared for factory to be erected by the Scottish Industrial Estates, Ltd., 3, Woodside-cres., Woodlands-rd., Glasgow, W.C.2, from plans by their architects at the Cairds-yard site.

Isle of Skye.—Inverness-shire C.C. is to have plans prepared for hostel accommodation and for which the architect is Alexander Cullen, O.B.E. (F.), County-bldgs., Inverness.

FUTURE CONSTRUCTION

PUBLIC APPOINTMENTS

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

JANUARY 12.

***†Peterborough T.C.**—100 houses, Eastfield housing estate. F. J. Smith, City E. & S. Dep. £2 2s. Tenders by January 29.

JANUARY 15.

***†Isle of Wight C.C.**—Extensions, Cowes secondary school. F. H. Booth, County A., Newport. Dep. £3 3s. Tenders by February 11.

***†Todmorden T.C.**—48 houses, Harley Wood estate. B.S. Dep. £2 2s.

JANUARY 16.

***†Stourbridge T.C.**—73 houses, Hodge Hill estate, Wollescote. G. N. Maynard, B.E. & S. Dep. £3 3s.

JANUARY 18.

***†Surrey C.C.** — Schools, Ruxley-la., Ewell, Garrison-la., Chessington, and Pollards Hill, Mitcham. County Architect, Kingston-upon-Thames. Dep. £2 2s. each (separate contracts).

JANUARY 19.

***†Burnley C.B.**—Site works in connection with the proposed Heasandford county technical high school for girls, Eastern-ave. Kitson, Parish, Ledgard & Pyman, chartered architects, Lloyds Bank-chbrs., Vicar-la., Leeds, 1. Dep. £5 5s.

***†Surrey C.C.**—12 police houses at various sites. County A., Kingston-on-Thames. Dep. £2 2s.

JANUARY 20.

***†North Riding C.C.**—Police houses at Redcar, Guisborough and Strensall. County A., Northallerton. Dep. £2 2s.

†Staffordshire C.C—Adaptations to Market Hall, Stone, for use as branch cty. library. A. C. H. Stillman, A. & S., Green Hall, Lichfield-rd., Stafford. Dep. £2 2s.

***†Stamford T.C.**—66 houses, shop and roads, etc., Drift-rd. estate. H. Baldwin, T.C.

JANUARY 22.

***†Lincoln (Kesteven) C.C.**—Eight implement sheds. R. F. Barton, County Land Agent, Sleaford. Tenders by February 3.

***†Plymouth T.C.**—School, Johnston-terr. Louis de Soissons, A.R.A., & Ptnrs., 5, Portland-sq. Dep. £3 3s.

***Portsmouth T.C.**—Marine garage and clubhouse, Broad-st. City A., 1, Western-parade. Dep. £2 2s.

JANUARY 23.

Bullingdon (Oxon) R.D.C.—26 houses at Culham. H. W. Smith, architect, 29, George-st., Oxford. Dep. £2 2s.

***†Northamptonshire C.C.**—Pair of police houses, King's Cliffe. J. Alan Turner, C., Northampton.

JANUARY 24.

***†Norfolk E.C.**—New schools at King's Lynn and Loddon. F. Lincoln Ralphs, Chief Education Officer, Norwich.

***Wallasey C.B.**—8 houses and garages, Chepstow-ave. Boro' A. Dep. £1 1s.

***†West Sussex C.C.**—Improvement to sanitary accommodation at Chidham school, near Chichester, and Coldwaltham school, near Pulborough. County A., Chichester.

JANUARY 25.

***†Gateshead C.B.**—(a) Extensions at residential special school, Hindley Hall, Stocksfield (tenders, February 14); (b) New tech. college, Gateshead (second stage, comprising 22 classrooms) (tenders, March 5); (c) two junior schools, Sheriff Hill, Gateshead (tenders, March 5). H. J. Cook, A.R.I.B.A., Chief A., Municipal Offices. Dep. £5 5s. each contract.

JANUARY 26.

***Canterbury T.C.**—18 flats, Spring-la. housing site. L. Hugh Wilson, City A. Dep. £2 2s.

***Croydon C.B.**—Alterations and renovations to lavatory accommodation, Portland School, South Norwood. Chief Education Officer, Katherine-st. Dep. £1.

***Esher U.D.C.**—Public convenience, Sandown Park. E. & S. Dep. £1 1s.

***†Eton R.D.C.**—Additions to Council offices. D. Hartley, architect, 14, Mackenzie-st., Slough.

Milford Haven U.D.C.—Erection of (a) 14 houses at Harbour-way, and (b) 28 houses at St. Lawrence Hill. E. & S., Town Hall. Dep. £2 2s.

JANUARY 27.

Cheltenham R.D.C.—12 houses at Back-la., Winchcoomb. Rainger, Rogers & Smithson, architects, 29, Rodney-rd., Cheltenham. Dep. £2 2s.

***Chertsey U.D.C.**—Repairs to ex-Army huts, Queenwood, Dunford and Whitebridge Camps. E. & S.

Mitford and Launditch R.D.C.—Six pairs of houses with site works and roads at Shipdham site. H. Marsh, architect, 4a, Market-pl., Dereham. Dep. £2 2s.

***†Newton Abbot U.D.C.**—42 houses, Buckland estate. S., 18, Devon-sq. Dep. £5 5s.

Tadcaster R.D.C.—12 houses at Sand-la., South Milford. Anthony Steel & Owen, architects, 89, Albion-st., Leeds, 1. Dep. £2 2s.

JANUARY 29.

***Burnley C.B.**—Convenience, Queen's Park. B.E., 22-24, Nicholas-st. Dep. £1 1s.

***Exmouth U.D.C.**—Demolition and clearance of farm buildings, Marpool Farm estate. R. J. Humphreys, E. & S. Dep. £2 2s.

***Preston C.B.**—Primary school, Ribbleton Hall-dr. B.E. & S. Dep. £2.

***Slough T.C.**—15 aged persons' cottages at Oldway-la., Cippenham. B.E., Town Hall. Dep. £2 2s.

JANUARY 30.

***Brighton C.B.**—Bathing station, west of West Pier. B.E. & S., 26-30, King's-rd. Dep. £2 2s.

***Flintshire C.C.** — Horticultural College, Celyn, Northop. W. Griffiths (L.), County A., Mold. Dep. £4 4s.

JANUARY 31.

***Northampton R.D.C.**—64 houses, various sites. R. J. Miller, architect, 1, Cheyne-walk. Dep. £3 3s.

***†Northumberland C.C.**—Technical college, Ashington. County A., Newcastle-upon-Tyne, 1. Dep. £5 5s.

FEBRUARY 1.

***Nottingham City.**—Prefabricated construction of secondary school, Hanslope-cres., Bilborough. R. M. Finch, City E. & S. Dep. £2.

FEBRUARY 2.

***Hereford City.**—Sale ring, Cattle Market. F. Margerison, City E. & S. Dep. £3 3s.

***March U.D.C.**—42 houses, Peas Hill. R. W. H. Jakens, architect, 4, Elwyn-rd. Dep. £2 2s.

Wellington U.D.C.—Four aged persons' bungalows at the junction of Hollies-rd. and Lawrence-rd. E. & S., Council Offices, 14, Walker-st., Wellington. Dep. £2 2s.

FEBRUARY 3.

North Kesteven R.D.C.—(a) Six houses, Branston Booths; (b) 6 houses, Thorpe-on-the Hill; (c) 4 houses, Beckingham. J. Chadwick, S., 31, Clasketgate, Lincoln. Dep. £2 2s.

FEBRUARY 5.

Dunmow (Essex) R.D.C.—8 dwellings at Abbeyview, Duton Hill, Gt. Easton. E. R. B. Harris, architect, 43, Bedford-row, London, W.C.1. Dep. £3 3s.

***Morecambe and Heysham T.C.**—12 flats, Trumacar-la. estate. B.S. Dep. £1.

***Norfolk C.C.**—Alterations and extensions, "The Elms," Earsham, near Bungay. County A., 27, Thorpe-rd., Norwich.

***Ringwood and Fordingbridge R.D.C.**—One block of 3 dwellings and 3 pairs of houses, Back-la., Damerham. F. Andrews (L.), architect, 45, High-st., Ringwood. Dep. £2 2s.

***Wokingham R.D.C.**—26 houses, Circket Hill estate, Finchampstead. E. G. V. Hives (L.), architect, 3, Cork-st., Reading. Dep. £2 2s.

FEBRUARY 6.

***Salop E.C.**—New wing at Haughton Hall residential special school, Shifnal. Hobbiss & Hobbiss, architects, 36, Waterloo-st., Birmingham, 2. Dep. £2 2s.

FEBRUARY 7.

***Tipton T.C.**—30 houses, Cupfields-ave., Upper Church Lane estate. Housing A. Dep. £2 2s.

FEBRUARY 8.

***North Riding E.C.**—New county school, Eston, near Middlesbrough. Horth & Andrews (FF.), Custom House-bldgs., Whitefriargate, Hull.

***Staveley U.D.C.**—22 houses, Inkersall Green estate. H. Cott, E. & S. Dep. £2 2s.

FEBRUARY 9.

***Burnham-on-Crouch U.D.C.**—Public hall. S. Bragg (A.), architect, 16, London-rd., Chelmsford. Dep. £3 3s.

***Wisbech T.C.**—4 bungalows, St. Paul's-cl., West-st. Gordon J. Woolton, B.E. & S., Exchange-sq. Dep. £1 1s.

FEBRUARY 10.

Bentley-with-Arksey (Yorks) U.D.C.—22 houses. R. N. Penlington E., Council Offices, Cooke-st., Bentley, near Doncaster. Dep. £3 3s.

FEBRUARY 12.

***Bucks C.C.**—Approved list of contractors. County A., Aylesbury.

FEBRUARY 14.

***Barnes T.C.**—14 houses and flats, Kingsway, Lower Richmond-rd., Mortlake, S.W.14. B.E. & S.

FEBRUARY 19.

***West Riding C.C.**—Schools at Cleckheaton Hightown and Stanley Wrenthorpe. County A., Bishopgarth, Westfield-rd., Wakefield. Dep. £2 2s. each.

FEBRUARY 20.

***Salop C.C.**—Dairy block, Shropshire Farm Institute, Baschurch, and conversion into home for old people "Coverfield," Whitchurch. A. J. Chant, County A., Shrewsbury. Dep. £2 2s.

FEBRUARY 26.

***West Riding C.C.**—School, Ekley. County A., Bishopgarth, Westfield-rd., Wakefield. Dep. £2 2s.

MARCH 5.

***West Riding C.C.**—Primary schools, Brighouse, Castleford and Sowerby Bridge, and secondary, Colne Valley, and extensions Ecclesfield Colley secondary school. County Architect, "Bishopsgarth," Westfield-rd., Wakefield. Dep. £2 2s. each.

PAINTING, ELECTRIC LIGHTING, MATERIALS, ETC.

JANUARY 24.

Middlesex C.C.—County E. & S. (Materials).
Wood Green B.C.—B.E. & S. (Materials.) Dep. £1 1s.

JANUARY 26.

Stamford B.C.—B.E. & S. (Materials).

JANUARY 27.

Mansfield B.C.—B.E. (Materials).
Stourbridge B.C.—E. & S. (Materials).

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JANUARY 29.
Gosport B.C.—B.E. (Materials.)

JANUARY 31.
Lambeth B.C.—B.E. (Materials).
Stevenage U.D.C.—E. & S. (Materials).

FEBRUARY 1.
Leeds T.C.—Highways E. (Materials.)
*†**Lincoln (Lindsey) C.C.**—Heating and electrical installation work in Technical College, Kingsway, Scunthorpe. County A., Lincoln.
York T.C.—City E. & A. (Materials).

FEBRUARY 2.
Bromley B.C.—B.E. (Materials).

FEBRUARY 3.
Prestwich B.C.—E. (Materials).
Staffordshire C.C.—S. (Materials.)

FEBRUARY 5.
*†**Birmingham City.**—Exterior painting of 660 houses. T.C.
*†**Halifax C.B.**—Outside painting of houses. B.E. Dep. £1 1s.
Rhondda U.D.C.—E. & S. (Materials).

FEBRUARY 6.
East Ham Corpn.—C. (Materials).

FEBRUARY 12.
Aldridge U.D.C.—E. & S. (Materials).
Rainford U.D.C.—S. (Materials).

FEBRUARY 26.
Malden and Coombe B.C.—B.E. (Materials.)

FEBRUARY 28.
Coventry T.C.—E. & S. (Materials).

MARCH 1.
Radcliffe B.C.—B.E. & S. (Materials.)

NO DATE.
Leicester C.C.—County E. & S. (Materials.)

ROADS, SEWERAGE AND WATER WORKS

JANUARY 27.
Border R.D.C.—Provision and laying of spun cast-iron and asbestos water mains, etc., and extension to existing filter-house, Crew Fell water supply. C., 7, Victoria-pl., Carlisle. Dep. £2 2s.
Dewsbury C.B.—Supply and laying of 1,500 tons of bituminised macadam in granite, slag or limestone aggregate. Boro' E., Municipal-bldgs., Dewsbury.

JANUARY 29.
Stockport C.B.—Supplying and laying of 51,000 yds. of rolled asphalt, Wellington-rd. W. F. Gardner, Boro' S., Town Hall.

FEBRUARY 17.
Maesteg U.D.C.—Sewerage and sewage disposal works. Thomas & Morgan & Partners, 23, Gelli wastad-rd., Pontypridd. Dep. £10 10s.

GENERAL BUILDING WORK

(LONDON)

Islington.—DWELLINGS.—B.C. propose to erect 153 dwellings on the Highbury New Park (No. 2) and Kelvin-rd. housing sites. Plans by E. C. P. Monson, F. & A.R.I.B.A., 120, Moorgate, E.C.2.
Islington.—FLATS AND MAISONETTES.—B.C. propose to erect 64 flats and maisonettes on the Holly Park, Alexander Road and Highbury New Park (No. 1) housing sites. Architects are E. C. P. Monson, F. & A.R.I.B.A., 120, Moorgate, E.C.2.
Islington.—MAISONETTES.—E. C. P. Monson, F. & A.R.I.B.A., 120, Moorgate, E.C.2, are the architects for 14 maisonettes on the Salterton-rd. housing site (part 3) for B.C.
St. Marylebone.—FLATS.—Plans for the development of 35-55, Boundary-rd. by the erection of 56 flats have been approved by the L.C.C.
St. Marylebone.—FLATS.—L.C.C. have approved B.C.'s sketch plans for the erection of 52 flats on the Hamilton-terr. and Carlton Hill site.
St. Marylebone.—FLATS, SHOPS AND GARAGES.—L.C.C. has given stage 1 (Town Planning) consent to a scheme prepared by T. P. Bennett & Son, FF. & A.R.I.B.A., 43, Bloomsbury-sq., W.C.1, for the erection of 121 flats, 11 lock-up shops, one bank premises and 17 garages on the Wellington-rd. sites (sites numbered 30, 31 and 32). Est. cost is £326,250. Messrs. Gardiner and Theobald, 24, Bedford-sq., W.C.1, are the quantity surveyors.
Walthamstow.—HOUSES.—Boro' Architect has submitted a plan for the erection of three houses and two garages on site of Nos. 35/41, First-ave.
Wembley.—FLATS.—Borough Engineer and Surveyor has prepared a scheme for the erection of self-contained flats on the site of the former gas cleansing station in Barnhill-rd.
Wembley.—FLATS.—Housing and T.P. comm. propose the erection of 54 flats on land on the west side of Fryent Way. Plans by Borough Engineer and Surveyor.
Wembley.—HOUSES AND FLATS.—Housing and T.P. comm. have approved, in principle, a scheme prepared by the Council's chief assistant architect, Mr. J. H. Daniell, A.R.I.B.A., for the erection of 52 flats and 12 s.-d. houses on site at corner of Kingsbury-rd. and Buck-la.
Wood Green.—CLUB, SHOPS AND FLATS.—B.C. have approved plans submitted by Montagu Evans & Sons, MM.Inst.R.A., 21, Brunswick-sq., W.C.1, for the erection of a four-storey building, comprising five shops and a club and 12 flats over, on land at corner of Bedford-rd. and Palace Gates-rd.
Wood Green.—FLATS.—B.C. have instructed Borough Engineer to submit sketch plans for flats to accommodate 80 persons on housing site "D."

"THE BUILDER" PRICES

COPPER, LEAD AND ZINC

The Ministry of Supply announces that from January 8 the prices at which copper, lead and zinc will be sold (subject to licence) by the Ministry to consumers in the United Kingdom will be the prices ruling on the next working day after the consumer's order is posted, and not the day on which the order is posted.

The Brass and Copper Tube Association announces that as from January 8 extras for brass and copper tubes have been increased as follows:

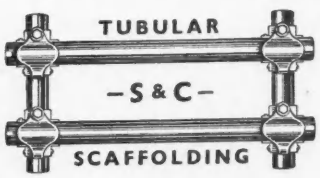
Extras for size—	*Per cent.*
Copper tubes	5
Brass and aluminium brass tubes	10
Copper-nickel tubes	10
Extras for small items	10

Other changes in extras have been made, and information about these changes may be obtained from regular suppliers or direct from the Association.

(PROVINCIAL)

Batley.—T.C. propose 56 houses, Staincliffe estate.
Brackley.—R.D.C. propose nine houses at Chacombe, seven at Charlton, seven at Greatworth.
Bradford.—City A. to prepare plans for new garage at Hammerton-st., at £20,000.
Colwyn Bay.—T.C. approved extensions to pier, etc., at £125,000.
Doncaster.—B.C. approved plans for factory at Wheatley Hall-rd., for P. Platts & Son, Ltd., 13, Market-pl., Doncaster.—Offices at Thorne-rd., for N.C.B. (N.E. Div.), Ranmoor-rd., Sheffield; extension to mining machinery works at Wheatley Hall-rd., for Geo. Moxon (Mining), Ltd.
Ennerdale.—R.D.C. approved layout for 70 houses, four shops and four flats at Egremont Smithfield estate, for N.E. Housing Association, Ltd.
Harrogate.—T.C. approved scheme for bathing pool and ice rink at Royal Hall-gdns., at £170,000.
Hebburn.—U.D.C. to build 80 houses on Campbell Park site from plans prepared by Surveyor, R. C. Bestow.
Huddersfield.—T.C. approved erection of clinic portion of new health centre, at £100,000.
Manchester.—Reg. Hospital Brd. received M.H. approval for following:—Extensions to operating theatre suite (£28,850) at Wigan Infirmary; conversion of wards A5/6 to pathological lab. (£26,000) at Crumpsall Hospital; erection of hostel (£17,000) at Mary Dendy Hospital.
Board approved:—Extensions at Oubas House Maternity Hospital (£28,227); alterations at Eavesla. Hospital Laundry block (£14,852); cubicisation of "A" block at Florence Nightingale Hospital (£8,003); new nurses' home at Manchester Victoria Memorial Jewish Hospital (£45,500). Architect to Board. T. Duffy, Sunlight House, Quay-st., Manchester.

Having Secured the Contract—what about the Steel Scaffolding?



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Manchester.—T.C. propose:—Library at Queen's Park.—Extensions to school of art at 5, Cavendish-st., All Saints.—Additional cloakroom and sanitary accommodation at Greenend C.P. School, Burnage-la., Burnage.—134 flats (scheme 111) at Greenwood-rd., Northern Etchells.—42 houses and eight cottage flats at Northern Moor Neighbourhood (scheme 116).—Governors of Jews' School propose new sch. at Wilton Polygon, Crumpsall.
Middlesbrough.—Final plans are being prepared by Boro' E. for submission to Home Office for a children's home at Beechwood.—Matkin & Hawkins, Barclays Bank-chbrs., Fawcett-st., Sunderland, are architects for extending a factory on East Middlesbrough trading estate for North-Eastern Trading Estates, Ltd., on behalf of Foister, Clay & Ward.—Plans are being prepared by G. P. Stainsby, 57, High-st., Stockton-on-Tees, for a church, hall and classrooms at The Greenway, Thorntree, for Trustees of Middlesbrough Methodist Church.—A sheet metal factory is proposed, Snowdon-rd., for L. D. & A. Bell.—T. A. Crawford, Borough-rd., Middlesbrough, has prepared a revised layout plan for 29 houses in St. Mary's Walk area, for H. Waddington, builder, Daleston-av., Linthorpe, Middlesbrough.—Beverley Bros., Ltd., to erect prefabricated licensed premises in Saltersgill-av. to plans by Kitching & Co., 21, Albert-rd., Middlesbrough.—Plans have been approved for extensions to offices in Marsh-rd., North Ormesby, for Teeside Bridge & Engineering Co., Ltd.—R. Cowan, 20, Finkle-st., Stockton, has prepared layout plans, etc., for stores, fitting shops, etc., in Cargo Fleet-la., for Tees Valley Water Board.—Wintersch-laden & Co., Ltd., are to carry out alterations at Sussex-st., Gosford-st., and Albert-rd. Architect, T. A. Crawford, Borough-rd., Middlesbrough.
Nelson.—B.C. Surveyor to prepare plans for 20 aged persons' bungalows.
Newcastle-on-Tyne.—E.C. to carry out alterations to "Moorlands" at Kenton Lodge training college, at a cost of £7,000. Plans are by City A., 18, Cloth-market, Newcastle. M.E. has approved sketch plans by Education A. (F. W. Harvey, F.R.I.B.A.), for the proposed Rutherford Grammar Sch., to cost £192,000.
Newcastle-on-Tyne.—Alterations are to be made to business premises of G. Woolf & Son, Westgate-rd. Architects, Stephenson & Gillis, Saville-chbrs., North-st., Newcastle.—Plans by City A., G. Kenyon, 18, Cloth-market, Newcastle-upon-Tyne, for 296 houses on Montague estate, have been approved.—Marshall & Tweedy, Grainger House, Blackett-st., Newcastle-upon-Tyne, are architects for 16 houses in Jenifer-gr., for Wilkinson Bros.
Northampton.—R.D.C. to erect 20 houses at Hackleton, 12 at Roade, 10 at Duston, 10 at Nether Heyford, six at Great Houghton and six at Wootton. Architect, R. J. Miller, 1, Cheyne-walk, Northampton.
North Riding.—E.C. proposes new cty. grammar sch. and cty. mod. sch. at Guisborough, and cty. mod. sch. and prim. schools at Whitby. Cty. Planning Authority is being asked to approve schemes.—C.C. has approved revised plan for a child welfare centre and health office at Richmond. Est. cost, £11,500.—C.C. to build div. police stn., court house and inspector's house at Richmond.
Rochdale.—Rochdale and District Hospital Management Com. propose spending £9,000 on conversion of Law Nursing Home as central clinic. 1951/2 programme includes:—New central services and admission block (£167,000); modernisation of "H" block (£14,200); extensions to doctors' residences (£14,000). All at Birch Hill Hospital. Also new casualty dept. at Rochdale Infirmary, at £12,200.
Salford.—E.C. seeks loan of £80,086 for proposed Duke-st. C.E. Sch. Architects, Cruikshank & Seward, 16, Princess-st., Manchester.
Southport.—E.C. seek M.E. approval to final plans for extensions to Tech. College.
South Shields.—T.C. to submit for M.H. approval a £21,048 scheme for shops and flats to complete layout of Lizard-la. estate. Plans by Boro' E. (John Reid).
Stalybridge.—B.C. propose further 40 houses at Buckton Vale site. Architects, Howard & Benson, 88, Mosley-st., Manchester.
Stockport.—B.C. propose four blocks of flats at Brinnington estate. Architects, Cruickshank & Seward, 16, Princess-st., Manchester, and G. Bullimore, Stockport.
Stockton-on-Tees.—G. P. Stainsby, 57, High-st., Stockton, has prepared plans for alterations for offices and warehouse in Wellington-st., for Whitelocks, Ltd.—F. W. Turnbull, White House, Carlton, Stockton, has prepared plans for 16 houses, Harlsey-cres., for N. Stonehouse, builder, Victoria Bridge, Stockton.
Tamworth.—R.D.C. to prepare plans for 30 non-traditional houses at Kingsbury.
Towcester.—R.D.C. propose 38 houses at Towcester, and 14 at Paulperspury.
Twrcelyn.—R.D.C. preparing plans for 1951 housing programme. Architects, T. Alwyn Lloyd & Gordon, Cathedral-rd., Cardiff.
Urmston.—U.D.C. propose 18 flats at Broadway. Surveyor, E. L. Leeming.
Weaverham.—Northwich R.D.C. approved erection of licensed premises by Greenall Whitley & Co., Ltd., Warrington (£35,000).
Wellington.—R.D.C. to erect 50 houses on Donnington estate.
Wigan.—E.C. seeks loan of £202,500 for new Sec. Tech. Sch. at Rectory Glebe site.
Worcester.—T.C. approved in principle proposal for an abattoir at northern end of Pitchcroft, at £40,000.

TENDERS

* Denotes *accepted*.
† Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modification*.
¶ Denotes *accepted by H. M. Government Departments*.

Aberdeen.—Erection of the Middlefield Primary School. Messrs. J. A. O. Allan, Ross & Allan (P., F)., 10, Bon Accord-st., West End, Aberdeen. Excavation, Brick, Building and Allied, etc., Works, W. K. MacLeod & Co., Ltd., Aberdeen, £19,200. Reinforced Concrete and Allied Works, etc., Stewarts Estates (Aberdeen), Ltd., Bridge-of-Don, £6,772. Joinery, carpentry and Allied, etc., Works, James Blake, Ltd., Aberdeen, £12,701. Asphalt and Allied Works, etc., Neuchatel Asphalte Co., Ltd., Glasgow and Edinburgh, £962. Steel Structural and Allied, etc., Works, George Bisset & Sons, Ltd., Aberdeen, £2,195. Steel Windows and Casements, etc., The Crittall Manufacturing Co., Ltd., Glasgow, £4,718. Plaster and Cement Work, Lathing, etc., Peter Cameron, Aberdeen, £4,705. Glazing, Painting and Decorative, etc., Works, James F. Gray, Ltd., Aberdeen, £3,595. Plumber, Sanitary Engineering and Allied, etc., Works, G. N. Haden & Sons, Ltd., Glasgow and Aberdeen, £6,694. Electrical Fittings and Installation Works, etc., George Angus, Aberdeen, £3,252. Carpark Works, etc., William Tawse, Ltd., Rubislaws, £3,269. Composite Flooring and Allied Works, etc., Prothero & MacNab, Ltd., Lord st., London, £4,831. Heating engineering, installation and Allied, etc., Works, G. N. Haden & Sons, Ltd., Glasgow and Aberdeen, £5,004. (Other contracts let.)

Anglesey.—New County Secondary School, Llangefni, for C.C.: *Pochin (Contractors), Ltd., King-st., Middlewich, Ches.

Billericay.—10 houses at Billericay permanent site, contract No. 12, for U.D.C. S., Council Offices: *Parrish (Builders), Ltd., Billet-la., Hornchurch, £12,691.

Blantyre.—54 houses at The Thornhill Housing site, for Lanarkshire C.C. Mr. Samuel MacColl, F.R.I.B.A., architect, County-chbrs., Beckford-st., Hamilton. Excavation, Brick, Building and Allied, etc., Works, Andrew Wright & Sons (Builders), Ltd., Blantyre, £25,579. Carpentry, Joinery, Ironmonger, Glazing and Allied Works, Red Cider Supply Co., Hamilton, £18,148. Roof Tiling, Roughcasting and Allied, etc., Works, Charles Wilson (Glasgow), Ltd., Glasgow, £4,777. Plumber, Sanitary Engineering, Gasfitting and Allied, etc., Works, Samuel Landery, Uddingston, £8,191, (Other contracts let.)

Bradford.—Reception block at "Springfield," Squire-la., for T.C.: *L. & W. Morrell, Ltd., Low Moor, Bradford, £19,765.

Brentford and Chiswick.—24 maisonettes at Windmill-rd., for T.C. R. Humphreys, F.R.I.C.S., M.I.Mun.E., M.R.San.I., B.E. & S.:—

Alfred Robinson, Ltd., Harrow	£44,236
B. Sunley & Sons, Ltd., S.W.1	44,192
Stone & Co., Ltd., Croydon	43,970
A. E. A. Prowting Ltd., Ruislip	43,550
John Mather (Builders), Ltd., E.C.1 ...	42,772
E. & J. Cotton, Ltd., Iver, Bucks	40,256
James Webb & Son, Ltd., E.C.1	39,945
Norman Sinclair, Ltd., Ealing, W.13 ...	39,933
Warboys & Sons, Ltd., Wembley	39,649
G. Ward (Ealing), Ltd., W.5	38,463
Circle Construction Co., Ltd., Wembley ...	38,175
Francis Jackson Contractors, Ltd., Ickenham	37,959
Ellis T. Amos, Ltd., E.C.3	37,279
Bury Building Co., Ltd., Ruislip	36,800
D.S.M. (Contractors), Ltd., Isleworth ...	36,229
Ealand & Pierce, Ltd., Kenton	35,191
*Orchard & Peer, Ltd., Wandsworth Common, Nightingale-la., S.W.12 ... ... (Borough Engineer's estimate, £43,145.)	34,060

Bridgnorth.—26 houses at Woodberry-cl. site, for T.C.: *Wm. Sharratt, Ltd., Wolverhampton.

Burgess Hill.—24 flats, for U.D.C.: *The Dorset Building Contractors, 11, Compton-av., Brighton.

Canterbury.—Junior school, Hackington, for T.C. Hugh Wilson, City A.: *Ringmer Building Works, Ltd., Lewes, Sussex, £51,298.

Cardiff.—Llandaff North secondary school, Bridge-rd., for T.C. City S.: *McLaughlin & Harvey, Ltd., 24, Highbury-gr., London, N.5, £134,945.

Dewsbury.—80 and 30 houses at Chickenley site, for B.C.: *Harlow & Milner, Ltd., Warren Yard, Warrengate, Wakefield, £87,895 and £32,749.

Dover.—Five blocks of 20 aged persons' houses at Buckland Valley estate, for T.C. B.E., Brook House: *Groombridge & Binfield, Alfred-rd., Dover, £23,200.

Glasgow.—New workshops for Thomas Caravans, Ltd., Carronshore, Falkirk, at Cumbernauld-rd., Millerston. *The Clyde Structural Iron Co., Ltd., Scotstoun, Dunbartonshire.

Greenock.—Police housing scheme at The Bawhirley-rd. Mr. Robert L. Rankins, M.Inst.C.E., etc., architect, Old Harbour Trust Offices, Wallace-sq., Greenock. *James T. Aitkenhead, general contractor, Greenock.

Hindley.—32 houses at Castle Hill estate, for U.D.C.: *J. Gaffney & Son, Whelley, Wigan, £38,109.

Hornchurch.—Houses for U.D.C. on Dovers Farm estate:—Four, *A. C. Salinger & Co., Ltd., £6,630; 32, *H. Webb (Builders), Ltd., £39,075; 12, *Percival Estates, Ltd., £14,268; 20, *S. H. Landsdell & Sons, Ltd., £23,743.

Ince-in-Makerfield.—14 aged persons' bungalows at Petticoat-la. site, for U.D.C.: *J. Gaffney & Son, Whelley, Wigan, £13,113.

Ketton.—12 houses at Great Casterton, nr. Stamford, for R.D.C. Architects, F. J. Lenton & Partners, 16, Broad-st., Stamford: *E. Bowman & Sons, Cherryhalt-rd., Stamford, £18,913.

Langport (Som.).—16 houses, Kingsbury Episcopi, for R.D.C. N. H. N. Darby (A.), architect, Westminster Bank-chbrs., Taunton. Quantities by D. J. Bendle, F.R.I.C.S.: *W. Coombes & Sons, Ilminster, £20,825.

Lindsey.—Junior school at Bowl Alley-la., Horncastle, for C.C.: *M. J. Gleeson, Ltd., 822, Chesterfield-rd., Sheffield, £59,500.

Liverpool.—Additions to Nuclear Physics laboratories at University: *Bovis, Ltd., London.

Liverpool.—Conversion of wards as nurses' accommodation at Alder Hay Hospital, for Regional Hospital Board: *Molyneux (Liverpool), Ltd., New Court-bldgs., Sir Thomas-st., Liverpool, £9,320.

¶London (Admiralty).—*Chatham*, R.N. Barracks, External painting, J. H. Durrant & Son, 282, High-st., Rochester, Kent.

London (Admiralty).—Civil Engineer-in-Chief's Department, Admiralty, have placed the following contract: *Dale, Pembs*, site works and 20 houses, Phelps & Owens, 11, Nantucket-ave., Milford Haven.

¶London (Air Ministry).—Contracts to value of £500 or over for weeks ended December 23 and 30:—
Building work: Walter Lawrence & Co., London, E.C.2; F. R. Hipperson & Sons, Ltd., London, E.C.2; H. Durrington, Gainsborough, Lincs; Kettlenhall, Son & Co., Ltd., Hull; Sir R. McAlpine, Wolverhampton; John Laing & Son, Ltd., London, N.W.7; M. & F. O. Foster & Co., Ltd., Hitchin, Herts. *Resurfacing*: Wirksworth Quarries, Ltd., London, N.1. *Hutting*: W. E. Chivers, Bulford Camp, Wilts. *Painting*: M. A. Appleton, Wolverhampton; Arnold Sharrocks, London, S.W.11; Industrial & Decorative Arts, Mansfield, Notts. *Maintenance work*: Rogers Bros., Ltd., Felixstowe; R. Bennett & Snare, Ltd., Ipswich; J. H. Woodward, Ltd., Leamington Spa; Peter Conlon, Manchester; Bosworth & Wakeford, Daventry, Northants; Dodsworth (York), Ltd., York; F. Parkinson & Son, Blackpool.

London (Air Ministry).—The Directorate of Contracts have placed new contracts to the value of £500 or over for the week ended January 6, as follows:—*Hutting*, W. and J. Glossop, Ltd., York; *civil engineering*, W. and C. French, Ltd., Buckhurst Hill, Essex; *building work*, Henry T. Hill & Son, Ltd., Farnborough, Hants; *painting work*, S. Lupton & Sons, London, S.W.1; Macartney, Ltd., Edinburgh; T. H. Kenyon & Sons, Ltd., London, W.9; Weatheralds, Ltd., Leeds; Reids (Norwich), Ltd., Norwich; W. Winstanley & Co., Ltd., London, S.W.1; *maintenance work*, W. A. Major, Marton Gainsborough, Lincs; G. H. Miller & Co., Ltd., London, E.7; and *resurfacing work*, Kings & Co., Ltd., Glasgow.

London (L.C.C.)—Following contracts exceeding £2,500 in value placed by London County Council from December 8-January 6: Electrical installation at Ritchie secondary school, N.1, Rae Electric (London), Ltd.; electrical installation at Oldfield-rd. school, Stoke Newington, Thorpe & Thorpe, Ltd..; four blocks of flats and other work on the Wimbledon Park Side (No. 1) site, Wandsworth, Rowley Bros., Ltd.; five blocks of flats on the Patmore-st. site, Battersea, Stewart and Partners, Ltd.; repair and decoration of the bandstand and café at Victoria Park, Godsell & Co. (Contractors), Ltd.; repairs after war damage and improvements at Yerbury-rd. school, N.19, Frank Batty & Smith, Ltd.; and repair after damage by fire and improvements at Plough-rd. school, Battersea, J. A. Tyler & Sons, Ltd.

¶London (M.O.W.).—Contracts by M.O.W. for weeks ended December 23 and 30:—
London: Air Ministry, Alexandra House, Kingsway, W.C., Repairs and internal decorations, John Greenwood, Ltd., King William-st. House, Arthur-st., E.C.4. G.P.O. Accountants Generals' Dept., 12-15, Finsbury-sq., E.C.2, Internal decorations, Sykes & Son, Ltd., 8, Essex-st., Strand. Hyde Park, Reconstruction of Palm House and houses, Galbraith Bros., Ltd., 34, High Holborn, W.C. *Glam*: General Training Centre, Curran-rd., Cardiff, Alterations and additions to first floor, E. J. Smith & Co., 43, St. James-st., Cardiff. *Kent*: Duke of York's Schools, Dover, Alterations and repairs to two school houses, C. Jenner & Son, Ltd., 5-9, Bouvrie-rd., Folkestone. *Middx*: National Physical Laboratory, Teddington, Hutted offices, Limpus & Son, Ltd., 7, Kingston-hill, Kingston-on-Thames. *Oxfordshire*: N.A.B. Polish Housing Estate, Nettlebed, Adaptations, Harry Russell, Ltd., Reading-rd., Woodley, nr. Reading, Berks. *Warwickshire*: Telephone Exchange, Chester-rd., Castle Bromwich, New extension, F. Deeley, Ltd., 208, High-st., Harborne, Birmingham. *Wilts*: Winterbourne Gunner, 42 houses, Geo. Wimpey & Co., Ltd., Hammersmith-gr., W.6.

¶London (War Dept).—Works contracts placed by War Dept. for week ended December 30. *Cornwall*: Miscellaneous, Hobbs & Knight, Ltd., Bude, Cornwall. *Glasgow*: Painting, Sunter Hastie, Glasgow. *Somerset*: Building, Geo. Wimpey & Co., Ltd., London, W.6.

Mablethorpe and Sutton.—30 houses on the Kingsley-rd. estate, Mablethorpe, for U.D.C. Watkins, Coombes & Barrell (F. & A.), architects, Heslam-chbrs., 191, High-st., Lincoln:—

Palmer Construction Co., Ltd., Louth ...	£51,670
Ellis Thompson & Co., Ltd., Louth	52,842
*Harry Dougill, Victoria-rd., Mablethorpe...	49,399

Maidenhead.—36 dwellings, Curls-la. site, for T.C. C. T. Read, B.E. & S.: *H. Street & Co., 226, High-st., Slough, £40,996.

Manchester.—Works for T.C.:—84 flats (Contract 119) at Woodhouse Park and Moss Nook: *Direct Labour; 15 houses (Contract 113B) at Northern Moor: *Poole & Foster, Ltd., Manchester; 22 houses (Contract 121) at Northern Moor: *W. Hodgkinson, Ltd., Whaley Bridge; 12 police houses: *Direct Labour; 12 staff houses at Kendal, for Northern Section of Haweswater Aqueduct: *W. H. Ainsworth & Co., Kendal; six cottages at Thirlmere: *J. & F. Hebson, Keswick; canteen and kitchen at New Moston Secondary School: *R. Street & Co. (Salford), Ltd.; erection of Button-la. County Primary School: *F. Marsland, Stockport, £54,000; erection of Moss Nook County Secondary Modern School: *Russell Building & Contracting Co., Ltd., Plymouth-gr., Manchester; erection of Newall Green County Secondary School: *W. J. Simms, Son & Cooke, Ltd., Nottingham, £182,019; adaptations at Heyrod St. Hall: *W. Fearnely & Sons, (Salford), Ltd., £47,825.

Manchester.—Conversion of pavilion 11 into outpatients' department at Withington Hospital, for Regional Hospital Board: *G. Fisher (Fallowfield), Ltd., Albany-rd., Fallowfield, Manchester, £14,733.

Middlesbrough.—68 houses at Berwick Hills, for T.C.: *Direct Labour.

Middlesbrough.—30 houses at Ambleside-gr., by private enterprise: *Dean Bros., Longlands-rd., Middlesbrough.

Mossend.—Plans in hand for office buildings and new lavatory block, etc., at the Mossend Works, Bellshill. *Colville, Ltd., 195, West George-st., Glasgow, W.C.2.

North Riding.—Erection of Guisborough County Infants' School, for E.C. Architect: William Tocher (A.), 8, Blenheim-st., Leeds 2: *W. Birch & Sons, Ltd., Spen-la., York, £52,815.

Nottingham T.C.—For the erection of Padstow-rd. secondary school. R. M. Finch, O.B.E., M.I.C.E., City Engineer and Surveyor, Guildhall. *Progressive Builders, Ltd., Nottingham.

Nuneaton.—Construction of War Memorial Garden and the George Eliot Memorial Garden, for B.C. B.S., Council House: *J. Paul & Son, Burbage, nr. Hinckley.

Penrith.—44 houses at Scaws estate, for U.D.C. F. Birkbeck, S.: *R. E. Reay, Penrith, £55,151 (revised tender).

Penrith.—Eight farmworkers' houses at Bowscar, for U.D.C. F. Birkbeck, S.: *Airey & Lewis, Penrith, £12,759 (subject to M.H. approval).

Prestwich.—16 houses at Carr Clough site, for T.C.: *A. Cassel & Sons, Ltd., 1-3, Teneriffe-st., Salford.

Rugby.—31 houses, Wolston, for R.D.C. D. G. McVinnie, M.I.Mun.E., M.R.San.I., M.Inst.H.E., S., 24, Warwick-st. Quantities by Collins & Britton, 39, Bennetts-hill, Birmingham:—

Drury, Ltd., Leicester	£47,398
Chowns, Ltd., Northampton	47,244
T. W. Corfield, Wolston	48,720
*G. W. Deeley, 27, Avon-st., Coventry ...	46,584

Salop.—Six pairs of firemen's houses at Springfield estate, Wenloch-rd., Shrewsbury, for C.C. A. G. Chant, County A., Column House, London-rd., Shrewsbury: *T. L. Perkins, "Leswyne," Wenlock-rd., Shrewsbury, £21,541.

Scottish Special Housing Association, Ltd.—Contracts placed November 21 to December 27:—

Site Servicing.

Kinlochard, Perthshire (12 trad., 12 unknown), Roy Cameron, Balfron, Water supply. Elibank, Peebles (8 timber); Cardrona, Peebles (4 timber), Modern Homes (Edinburgh), Ltd., 4, Melvillecres., Edinburgh, Water supply. Forehill-rd., Ayr (2nd development), Hay & Anderson, Broomhill Farm, Kilwinning, Stockproof fencing.

House Erection.

Redburn-rd., Prestonpans (100 trad.), Northern Sports Ground Construction Co., Edinburgh, Divisional and chain link fencing. Borestone, Stirling, (100 trad.). S. E. Scotland Electricity Board, Stirling, Electricity services (mains to meters). Cummings Park, Aberdeen (100 Cruden), Barnet & Morton, Ltd., Kircaldy, Divisional fencing. Grieve-rd., Greenock (44 Atholl), S.W. Scotland Electricity Board, Glasgow, Electrical services. Millgate, Winchburgh (46 Miller), Scottish Gas Board 15, Calton-hill, Edinburgh, Gas services. Wallyford, Midlothian (202 Cruden), Scottish Gas Board, Musselburgh, Gas services. Townhead, Coatbridge (10 Weir), Weir Housing Corporation, Calder-st., Coatbridge. All trades. Cadder-rd., Glasgow (352 trad.), Scottish Gas Board, 522, Sauchiehall-st., Glasgow, Gas services (mains to meter position). Millgate, Winchburgh (46 Miller), James Miller & Partners, Ltd., 18, George-st., Edinburgh. All trades. Caponflat, Haddington (26 trad.), D. J. Rose, 5-6, Market-st., Haddington. Electrical. Langside, Kilbarchan (8 trad.), S.W. Scotland Electricity Board, Glasgow, Electrical services. Mountfleurie, Leven (trad.), Barnet & Morton, Kirkcaldy, Chain link fencing. Arrocher, Benmore, Glenfinert Glenbranter, Argyllshire (timber), Alexander & Son, Belford-rd., Edinburgh, Metal handrails at rear doors. Sauchenbush, Kirkcaldy (350 Weir), Barnet & Morton, Kirkcaldy, Chain link fencing. School site, Winchburgh (20 Miller), S.E. Scotland Electricity Board, Stirling, Electrical supplies. Millgate, Winchburgh (26 Miller), S.E. Scotland Electricity Board, Electrical supplies. Bo'ness (58 Atholl and 204 Cruden), Scottish Gas Board, 25, Chester-st., Edinburgh, Gas supplies. Chryston, Lanarkshire (102 trad.), Scottish Gas Board, 522, Sauchiehall-st., Glasgow, Gas supplies. Toryglen, Glasgow (260 tenement), Small & MacDonald, 183, W. Campbell-st., Glasgow, Electrical.

Site Servicing.

Forehill-rd., Ayr (2nd Development), 1st stage site servicing. Sanquhar, Dumfries-shire (76 Atholl), 2nd stage site servicing. Mains of Fintry, Dundee (360 various), Road surfacing. West Kilbride-rd., Dalry (150 timber, 10 trad.), In situ footpaths. Cairnhill, New Cumnock (50 of 180 various), 1st stage site servicing. Valley Gardens, Kirkcaldy, 1st stage site servicing.

House Erection.

Sauchie, Clackmannan (104 trad.), Several works, excepting electrical and plumber. Tullibody, Clackmannan (44 trad.), Several works, excepting electrical and plumber.

Maintenance.

Airdrie (20 flat roofed), Neuchatel Asphalte Co., 37, George-st., Edinburgh, Roof resurfacing. Bellshill (2 trad.), Alex. W. Thomson, 132, Main-st., Bellshill, Plumber. Bellshill (2 trad.), Boyne, Smith & Wylie, 22, Neson-st., Edinburgh, Electrical.

Shenfield.—Block of five flats at "Glendale." Architects, W. J. Lewis & Sons (F. & A.A.), 68, Cranbrook-rd., Ilford, Essex: *A. Saunders, Western-rd., Brentwood, Essex, £10,654.

Staffs.—Erection of County Primary School in sectional timber construction at Ocken Hill, Tipton, for C.C. A. C. H. Stillman (F.), Architect & S., Green Hall, Lichfield-rd. Quantities by H. Vale & Sons: *T. & G. Perry, Ltd., Lower Stafford-st. Works, Wolverhampton, £19,285.

Stockport.—53 houses at Thornley-la. site, for T.C.: *J. & J. Oakes & Sons, Ltd., 144, Dialstone-la., Great Moor.

Stretford.—Erection of new High School for Girls, for Lancs E.C.: *G. & J. Seddon, Ltd., Little Hulton, nr. Bolton, £147,650.

Walthamstow.—Erection of 12 flats and 8 maisonettes on the Evesham-ave./Chingford-rd. site. *H. C. Leach, Ltd., Waltham Cross, £34,000.

Wembley.—Erection of 114 flats on site in King's-drive. *Circle Construction Co., Ltd., 65, Wembley Hill-rd., Wembley, £178,417.

West Bromwich.—40 houses and flats at Hateley Heath estate, for B.C.: *Asphalt & Public Works, Ltd., Norwich Union-chbrs., Congreve-st., Birmingham, £41,676.

West Hartlepool.—104 houses at Owton Manor estate. Plans by Boro' A., Municipal-bldgs.: *Hartlepools' Master Builders' Association.

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